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Toys, Games and Apparatus

For Children with Cerebral Palsy

Gladys Gage Rogers and Leah Thomas

(Editor's Note: There have been so many requests for this article that the authors were asked to revise it for republication. It originally appeared in the January-February 1935 issue of THE PHYSICAL THERAPY REVIEW.)

During recent years the medical profession and the public have become increasingly aware of the large number of children with cerebral palsy. This group has been a challenge to the medical profession, and today, from coast to coast, there are special clinics for their care. They urgently need an opportunity for education and now many of them are in schools throughout the country. Many of us who are watching this impetus know that new state institutions are just around the corner. "Institution" is not the correct word; "school" is not the correct word either. We must find a new word suggesting a combination of home, school and hospital. These new centers must provide facilities for medical care and education in many specialized fields which at present are available only in widely separated cities and towns.

From the many already well-established clinics the physicians are selecting the children who have the mental capacity and physical ability to compete with normal children. These children are the lucky few. They have an opportunity to gain a normal education, each making progress at his own rate of speed. Some of these children will be self-supporting.

The larger group is made up of children with normal mentality but with physical disabilities which prevent them from competing with normal children. This is the group for whom the new state centers must be planned. Physicians, physical therapists, nurses and the public should plan now to prevent lowering the standards of the group with normal mentality by not permitting the inclusion in these centers of those children with subnormal mentality.

The centers will not be hospitals or schools alone. These centers will be homes first of all. Improved physical skills and education will be the goal of every child there. For children with cerebral palsy, skills and education are gained only by an uphill road over which they fight with courage and determination. Most of these children will live in these centers for many, many years. We must all work with imagination to give them an opportunity to find "the joy of living."

The following suggestions are a small part of the type and kind of material which physical therapists should be gathering in order to have ready a new creative program for this particular group. The search for toys, games and apparatus is nationwide. However, it seems impossible to make these lists without first mentioning two far more important factors than the toys themselves. One factor is the setting or environment in which the toys are used, the other factor is the psychology of their use. These factors are of paramount importance because the principles underlying the therapeutic value of using toys must be applied, not for a few years, but for fifteen or twenty years.

The child must discover the way open to him through his own efforts, an effort that calls into

Ascutney, Vermont.

play all the capacity for activity that he has. We must see that a child has within his reach, if he will make an effort, toys that stimulate him to continued activity. This activity must bring satisfaction and a sense of accomplishment.

A specific example is the peg board which is well known to all. No child with normal mentality can be expected to enjoy placing pegs in this board for two or five years not to mention the possible need of this exercise for ten years. A step of imagination will lead us to realize that there is an equal amount of therapeutic value in placing faggots on a fire in an Indian village. The anticipation of lighting the fire in evening when the hunters return with their deer is stimulation enough to lay a large fire of which the child may well be proud. This means that the exercise has been repeated willingly many more times than would be possible with a monotonous peg board.

The demand for persistence and exertion which does not bring satisfaction to the child produces instead discouragement and an unwillingness to exert himself again. Ordinarily the little child has a strong desire to roll, creep and later to walk. He will make vigorous effort to reach for and manipulate objects. Too often the handicapped child finds that his efforts have been futile; there is nothing in his environment that he can successfully control except his parent. If his own activity gives him no satisfaction, he will demand entertainment provided by others, or passively accept defeat. There should never be discouragement or impatience; never let the child think you are disappointed, and always make him think he has done better than you expected him to do. Remember that the tone of the voice means as much to the little child or perhaps more than do the words. Some teachers advocate a daily chart for exercise to let the child watch the improvement curve. It seems wiser not to start the chart until you are sure that the daily improvement will be large enough to encourage him. To set a goal, "when you can walk," if far beyond the child's present ability, may be a discouragement rather than a stimulus. There should never be competition or a time element unless it is all made a happy joke. Daily exercises, under the direction of a person trained in this work, must keep the muscles in condition to function, prevent contractures, demonstrate new motions, but the actual control of the muscles depends upon the purposeful effort expended by the child.

Each toy should be selected for its therapeutic value. The first principle is to make certain he will not be discouraged by finding it too difficult to manipulate. If the child is eager to play with a certain thing, complete frustration is apt to make him tense and nervous. A phlegmatic child will simply cease to try. Always have a suitable toy within reach which he can pick up and hold in his hand if he cares to. If it is something he enjoys, he does not think of it as an exercise, but as a game.

Education, play and exercise should be of therapeutic value. These should go on continuously throughout the day without the child being conscious that most of his activities have been planned to this end. In this way far greater progress will be made than the usual half hour of intensive muscle training and little or no occupation for the remainder of the waking hours.

SUGGESTIONS FOR FINGER, HAND, AND ARM EXERCISES SITTING AT A TABLE

1. A musical dinner gong, such as is used in dining cars affords great joy.
2. Cover the entire table with a large sheet of paper tacked down with thumb tacks. Use large jumbo crayons which can be grasped easily.
3. Put paper clips on letters and words. Use magnet to draw out letters and form words—in same way draw out words to form sentences. (Milton Bradley school material.)
4. Magnetic toys demand less skill of motion than the above suggestion. (5 and 10 cent stores.)
5. Fishing with a magnet on the end of a string. Have fish in a basket and catch them by dropping magnet into basket. On each fish have a problem or letter or word. ($2 + 3 = 5$, or A, B, C, or ran —horse, etc.)
6. Dusting with a cloth always seems to give pleasure, and helps with big arm movements. A paper napkin in each hand to wipe the table is enjoyed a few times.
7. A large dishpan of water in which to push around floating toys.
8. A table with a two inch rim on three sides and one-half inch on front side will prevent toys from constantly dropping to the floor. Bore holes in opposite rims and tie strings in these holes so that the strings run lengthwise across the table. Fasten spools, buttons, beads, blocks on the strings. Use toys which may serve a constructive purpose. Count spools or buttons, learn colors with beads, name the animals, have letters or words on the blocks. If the child is not old enough for this suggestion, tie on soft stuffed animals or dolls to play with. Stretch colored elastic bands across the table in the same way the string is fastened. Pull these bands forward, then let them snap back to place, knocking down wooden men or small toy nine pins. Count the pins and add the score each time.
9. A large plate of flour, make finger patterns.
10. Jack stones are too difficult to play the cor-

rect game, but children enjoy moving them about.

11. Printing pad: animal stamps as well as letters and words can be found for this purpose.

12. Printing set or printaprimer.

13. Anagrams.

14. Make tracks like animals—use water color on end of fingers or make tracks in plasticene.

15. Small sand box on the table.

16. Bread dough—the children like the feeling of bread dough and will mold this long before they show interest in plasticene.

17. Clothes pins—these can be fastened together to make queer designs. This has an advantage of using both hands. A few colors or faces on the pins will make them more interesting. Push clothes pins or different shaped pegs into clay.

18. Roll balls across table—try to hit object. Rubber balls covered with worsted netting are desirable in certain cases.

19. Roly-poly toys are excellent. One child made her first successful attempts with hand exercises playing with these.

20. Piling up large square bean bags is not so discouraging a task as blocks.

21. Tinker toys—these demand more degree of skill than most other suggestions.

22. Bead numerical frames—different colored beads are pushed back and forth on wires. Colors may be learned. Addition and subtraction in arithmetic may be made interesting.

23. A large peg board—put large different colored pegs in holes in board—then put a corresponding wooden colored cap on each peg. (Milton Bradley.)

24. Hammer and nail set. (Milton Bradley.)

25. Clay molds.

26. Spatter work.

27. Soap bubbles.

28. Cut art stencils to crayon.

29. Large wooden beads—round and square—one half inch to one inch size.

30. Bell—similar to those on teachers' desks.

31. A, B, C weaving looms.

32. Circular or straight knitting frames.

33. Finger painting. This has been very successful when done to flowing music. Two of our children used their bare feet with great enjoyment and made very interesting pictures.

SUGGESTIONS FOR CHILDREN LYING ON A MAT ON THE FLOOR

If the child can lie prone this is the best position—he will then use his back and neck muscles to great advantage.

34. Small furry animals or rag doll to pick up.

35. Small bean bags—the shape of a half moon will fit the hand. Small turtles and a Chinaman that can be held by his queue are interesting.

36. Small bells to shake.

37. Rubber toys of all descriptions—when squeezed they make a noise or squirt water.

38. Blowing feathers.

39. Blowing or hitting balloons.

40. Jumping toys—bunnies, ducks and frogs which hop along by squeezing bulb.

41. Push around floating toys in low pan of water.

42. If outdoors—put mattress where child can pick grass, clover and wild flowers.

43. Change beans or wooden beads from one bowl to another.

44. Rattles disguised with more grown up ornaments.

SUGGESTIONS OF TOYS WHICH MAY BE USED SITTING OR STANDING WITHOUT A TABLE

45. Leather string with soft toy on end to whirl around in big arm circles.

46. Toy clothes pins and line for doll clothes. (a) wash tub; (b) wringer; (c) iron.

47. Wooden dishes.

48. Toy brushes with dust pan. Feather duster.

49. Dish mops with faces.

50. Building blocks of every description.

51. Pretty boxes or toy eggs to open and close. Smaller ones inside of larger ones.

52. String to pull and ring a bell or a row of bells.

53. String to pull on and turn off electric light.

54. Watering pot—used in bath tub with great glee as well as out of doors.

55. Ball on elastic—this can be thrown at a distance and will come back to child.

56. Accordion.

57. Tambourine.

58. Drum.

59. Wrist bells.

60. Xylophone.

61. Harmonica.

62. Toy piano.

63. Other rhythm band instruments.

64. Blowing out paper toys—these are long narrow strips of paper with a feather on the end.

65. Sandbox—have a long narrow sandbox where the children may stand beside each other rather than opposite. This will prevent the accidental throwing of sand in other's faces. Children who cannot stand alone may be strapped to the box if given support around the hips and low back. Others can stand between a wall in back of them and the sandbox in front. Many of them stand in their walkers which may be pushed close to the sand.

66. Wooden sand toys.
67. Wheelbarrow—to fit particular child—this toy necessitates using both hands. This will be a great aid in maintaining balance, if instead of one wheel, two wheels are used across the front. These wheels are on an axle the same as two wheels from a doll carriage. Fasten the box part of the wheelbarrow on to this axle.
68. Doll carriage. Weight with stones or sand bags.
69. Toys on ropes to be pulled.
70. Small buckets to wind up on string or chain. These can hold water or sand and be drawn from over a wall.
71. Light punching bag—burlap stuffed with rags will answer the purpose.
72. Ring toss. Use rubber rings.
73. Ball board—balls roll on an incline and drop with a click into holes. Each hole is numbered and scores may be kept.
74. Waterproof dolls—these can be tubbed like real children.
75. Telephone with dial.
76. Raffia or yarn—if braiding is difficult strands of different colors may be wound around each other.
77. Toy money.
78. Cash register.
79. Inexpensive typewriter with letters on a dial.
80. Sewing cards.
81. Enlarged art crayons — wax, hexagonal in shape four and one-half inches long and one-half inch thick.
82. Large pencil—Eagle brand, 75-12 automatic, eight inches long, three-quarters inch in diameter.
83. Magnetized letters for a blackboard—they cling to the board or may be pushed about.
84. A bar or pulley handles.
85. Balloons.
86. Set of flags—twenty-three nations. (Educational Playthings, Inc.)
87. Telegraph set—a child may learn to tap by the Morse Code.
88. Winding mechanical toys or victrola.
89. Marbles.
90. Twister toys.

We suggest that mothers and physical therapists send for catalogues from

Milton Bradley Company,
Springfield, Mass.

Educational Playthings, Inc.
20 East 69th Street,
New York City.

The Ideal Line—Distributed by
J. L. Hammett Co.,
Cambridge, Mass.

J. L. Hammett Co.,
Kendall Square,
Cambridge, Mass.

Childhood, Inc.
32 East 65th Street,
New York City.

Montessori Material,
J. L. Hammett Co.
Kendall Square
Cambridge, Mass.

GAMES

Group games afford the happiest moments of the day. Almost every game must be adapted in some way for these children. Many of them are changed beyond recognition, but this in no way decreases the joy and good spirit of the games. Almost every child in our group has experienced from three to eight years of a lonely, inactive life. Each child has been the center of his own world. His life goes on at a tempo which he sets. His activities are governed by his physical limitations. His interests and education depend entirely upon those of his parents, many times one parent.

We believe for these children suitable group games will have educational value. This type of child tends to react slowly to external stimuli. They are slow to think, to hear, to observe, to see and to do. At first many of them appear to be almost oblivious to what goes on around them. In proportion to the improvement possible with these children, we are certain they react to group games as favorably as a group of normal children.

Sense perceptions are quickened; each child grasps more quickly that it is his turn, that the balloon is coming his way, that he is in danger of losing by a wrong guess. He hears footsteps behind him. He soon knows what to do when his name or number is called. Will-power develops and inhibitions vanish through games. A social sense which leads to social cooperation and good will is, for these children, one of the most valuable assets to be learned through games. During the game hour they are in a world of many people. Since these children are alone so many hours of every day, the game time should be carefully planned to give them every advantage of group play.

Tests of skill or strength, methods of capture, running, competition and all the usual excitement which accompanies games are barred to us. Such activities are not necessary because we must find games that have their value in a "carry-over" which can be applied in an inactive world.

Singing games are, no doubt, the best beginning for play with these particular children. They are simple in content, the pianist can set a slow rhythm

and the activity naturally cannot extend beyond what the piano is telling us to do.

To the surprise of the instructors "Ten Little Indians" served a bigger purpose than ever before in the history of its being sung. During Indian week we come to assembly dressed as Indians. There are one, two or three feathers in our hair. Some of us carry newspaper tomahawks, while others carry tom-toms made of oatmeal boxes. The pianist surprised us all by arriving with a papoose strapped to her back. The day before we made a teepee and laid the fire mentioned elsewhere in this chapter. We have had real Indian dishes at meals and we have read Indian stories. So, this morning at assembly we are not playing Indians, but we are actually living Indians, and for the first time we are living the Indian stories we have heard.

In such a setting we are not going to have time to regret that we cannot hide in ambush and spring upon the enemy or that we cannot perform the authentic war dance. It is enough for us to be content with less. We are all sitting in a circle. One child is named as the first Indian. As we sing "One Little Indian" he stands before his chair—"Two Little Indians," the next child is helped to his feet and then he proudly stands alone to the end of the verse. "Three Little Indians," the next child is helped to stand and is assisted in standing throughout the verse. When ten little Indians are standing the first verse is ended. Beginning with the tenth Indian we sit down, one by one, as we sing through the second verse. The children loved this song and frequently asked for it. The action is so simple that we can readily assume that each child felt a satisfaction in doing his full share in the group activity. There is no reason for apologizing for this simplicity in action because at four, five or six years of age, many times standing up and sitting down are envied performances which these children have seen accomplished by other children, whom they secretly know are still babies. It is a valuable exercise for these children to stand up and sit down to music. They are so distracted by the fun of doing it this way that most of them do not seem like the same children attempting to stand at the direct command of an adult.

We have a prayer to the Indian Sun God. The children refuse to be left out of this worship. A councilor with perhaps less spiritual enthusiasm for this particular form of worship, kneels beside a child who needs assistance, holds him in balance and raises his head, arms and hands in benediction. In circle formation we are kneeling on the floor. The body is bent forward with the head touching the floor and arms extended forward overhead. As we sing, "Wa-Kon-da-dhe-dhu. Wa-pa-dhin-a-tonhe," we raise our heads from the floor and extend the arms upward to the sky. During the second verse we return slowly to the starting position. The difficulty in balancing is somewhat forgotten by the aid of the soft flowing music. Before Indian week is over most of us have learned to do this exercise in a more relaxed degree than we did at our first attempts.

Indian music and Indian dances give us many avenues leading directly to beneficial muscle training. Of equal importance is our endeavor to create so vivid a story of Indian life that our week of Indian games may be the foundation of a real and lasting interest in Indian history. We aim to make the high points of each week so broad and far reaching that these interests will grow, and leave less time for regrets that our physical prowess is not greater.

"How do you like to go up in a swing" a song with words by Robert Louis Stevenson, music by Reginald de Koven is another favorite. We stand in a circle, partners facing each other and holding hands. Last summer we had three "walkers" in the circle. Through the verses and chorus the arms swing from side to side in slow rhythm. During the chorus "Swinging, swinging, swinging, etc.", one child runs under the swinging arms and continues around the circle until the music stops. When the song has been learned thoroughly and the first enthusiasm is lessened by repetition, select a child in one of the walkers to go around the circle as the others have done in turn. There is a hushed outstanding joy surrounding the group as each set of couples silently moves to adjust the formation of the circle to allow adequate space for the walker. At the suggestion of the children this game never ceased until, with awkwardness and patience the other two children in walkers had been pushed around with the gaiety and spirit of fairy dancers. We had all danced a solo part from start to finish. The mother of one of our oldest children told us that her daughter had been practicing standing alone during the winter, because she enjoyed the dance so much she wished to show us her improvement in executing it the following summer. She did accomplish this end.

The action of the words in "Hansel and Gretel Dance" can well be carried out sitting in a circle. Instead of turning in place standing as we sing "Round and round and back again" we make big arm circles.

Another game is that of rolling a big ball across a circle trying to make it go out between persons in the circle. It is called Circle Stride Ball on playgrounds. We sit in a circle and allow the children to kick with the feet or hit with the hands. This is an excellent game because there is no waiting for

the slower children. The ball is always in play. Within a short time there is marked improvement in skill.

It is impossible to give further details of games but a short list of those we have used successfully follows:

Singing Games

Oats, Peas, Beans and Barley Grow
Shifty Shadow
Did You Ever See a Lassie?
Farmer in the Dell
Looby Loo
Muffin Man
Mulberry Bush
Nuts in May
The Steeple Bells
Snail
Row, Row, Row Your Boat
Little Bo Peep
Sing a Song of Sixpence
My Old Dan
Round and Round the Village

Games Without Music

Balloon games
Hide the Thimble

Guessing Games

One variation we make is to whisper to one child some action which he can do while the others guess —such as an airplane or shoveling coal on the fire, going upstairs.

Simon Says.

Pass two bean bags around circle.

Nine Pins.

Games which children may play in smaller groups according to physical limitations

Croquet.

Dart game—we hesitate to mention this but the children ask for it daily. It is a special favorite for rainy days.

Simple ball games with enough councilors to keep the ball in play.

Tether Ball. (Miniature pole braced on table.)

Bean Bag.

Peggoty.

Throwing dice for many games where men are moved about on a board.

Spinning for numbers to move men in such games as mentioned above.

Dominoes.

Tit tat toe.

APPARATUS

1. A rather heavy table similar to the old fashioned kitchen table is very useful. Cut a round hole in the top eight inches in diameter. Put wooden rims, two inches high on all four edges of the table. This will prevent play toys from dropping to the ground. The child can stand inside this table and have excellent support. Casters on the legs for indoors or larger wheels for out-of-doors will allow the child to move about and make the play time more interesting.

2. A small table with the legs cut short the correct height for the child when kneeling is excellent for children who cannot stand, but can kneel. If they fall because the knees slip forward under the table, place a board in front of the legs at one end. This gives the child a chance to brace his knees. With this support at the knees and the top of the table giving support at the height of the chest, children can crayon, look at books, or play games on the table. Children will remain in this position for a long time without fatigue. It is an important step toward strengthening the back muscles.

3. Jungle gym—during the summer we live in medieval England, so, the jungle gym is not a jungle gym, but a beautiful castle which stands near Sherwood Forest. There are several long lanes of pipes leading to it. These are not pipes to which we must cling and pull along to reach the framework and there attempt to do certain exercises we have tried to do for days or weeks past. These pipes are avenues leading to the castle to which we have been invited to make a visit. We frequently refurnish the castle and then we explore from top to bottom and tell what we find as we travel from room to room. Knights in armour on white chargers are sometimes at the door and we go racing off with them after the castle inspection is over. Beside the jungle gym are sand tables by which the children in walkers are playing. They can hear the conversation during the castle adventure and frequently the piles of sand tell the same story of the beautiful castle and its white chargers.

4. A ladder will be found more useful if it is fastened to the side of the wall. This will give support to the toes and prevent the feet slipping forward as the foot is placed on the rung. This ladder may well serve as the bar on which the child may pull himself from a sitting to a standing position.

5. A see-saw is enjoyed. At each end, in front of the sitting space, have an upright with handles to which the child may cling or be tied with straps.

6. Heavy book racks similar to music stands may be placed by the tables in which the children stand. There is no possibility of the child hitting this with his hands and he may read or ask another child to turn the pages as they look at pictures together.

7. Tricycle—fasten a board six inches wide, vertical to the rear axle. It should extend from this axle to a height of the child's shoulders. Fasten it at the axle and back of seat. Strap the child to this board with one strap under his arms and another around his hips. Tie the feet on to the pedals with two-inch straps made of inner tire tubes. These

are strong and will cling to the foot, the ankles and the pedals the same as a bias piece of cloth. Tie the hands securely with bandages, over and over the handle bars and around the wrists. Fastened this way, a child of tetraplegia type felt so secure that she would relax and ride up and down the corridors and in the ward of a hospital. Within a few weeks she could travel about alone. When sitting at a table she could not control her arm movements. Her fingers were in constant motion and she could not pick up anything from the table. With her hands tied around the handle bars and feet tied to the pedals she gained muscle strength and coordination in learning to steer and pedal.

8. A velocipede is better for some children than a tricycle.

9. A blackboard serves many purposes. Lines and circles drawn to music are helpful. If the child cannot hold an eraser, a dust cloth will serve as well. Chalk can be purchased one inch in diameter. Tie this to a string fastened to the top of the frame to prevent the chalk from falling to the floor. Magnetized letters will cling and can be pushed around on the board. We have found that sticking an end of the chalk in a soft ball or inside of a ball of cotton is an aid in helping the child hold it.

10. Ramps used instead of steps by the porches are as valuable as any apparatus we have found.

Our book, "New Pathways for Children with Cerebral Palsy," contains more practical material for group instruction than we have been able to locate in any other publication and no doubt would be of value to anyone wanting toys, games and apparatus for children with cerebral palsy. This book was published by Macmillan in 1935 and is now out of print. It could be found in medical libraries only.

Physical Therapy and Nursing
In a Public Health Program

Esther Gillette

As public health programs are expanded to include physical therapy, the need is felt for a closer relationship and better understanding between the nursing and physical therapy services. In order to further this relationship the public health nurse should have some knowledge of the aims and purposes of physical therapy. This may be accomplished by including instruction in the basic principles of physical therapy, something of the procedures and types of treatments, and also the *limitations* of physical therapy. One precaution after this instruction is that the public health nurse should not consider herself qualified to give physical therapy treatments any more than the physical therapist should consider herself qualified to give trained nursing care just because she knows how to make a bed or take temperatures.

The field physical therapy program now in operation in Colorado is largely a teaching program—that is, teaching the parents or other members of the family to carry on the exercises or other treatment in between the visits of the physical therapist. As the physical therapist serves a much larger area than the public health nurse, the nurse becomes a vital part of the program because she is able to check on the patient and learn if the instructions of the physician and physical therapist are being followed. The nurse makes at least one visit to the home of the individual in company with the physical therapist so as to observe the treatment and to learn the instructions that are to be followed. Without a knowledge of the principles of physical therapy this service is useless. Frequent conferences between the public health nurse and the physical therapist are necessary and should be followed by practical applications on the patient.

The topic of body mechanics has been discussed as one subject in which physical therapy can contribute to nursing education. More and more the importance of this is being demonstrated in our field program. In several instances the school nurses in rural areas have asked for help from the physical therapist regarding the posture of the school child. The physical therapist can contribute much to a school health program by instructing the school nurses in the basic principles of good posture, and by pointing out some of the most common points of poor posture which frequently are found in the school child. If the nurse is trained to observe these conditions and then refer the child to a

(Continued on page 22)

Physical Therapy Consultant, Crippled Children's Section, State Department of Public Health, Denver, Colorado.

Read before the Annual Conference of the American Physical Therapy Association, Chicago, Illinois, May 1948.

Relative Importance of the Muscle Pump in the Prevention of Gravity Shock

F. A. Hellebrandt, M. Katharine Cary, Ellen Neall Duvall, Sara Jane Houtz, Helen V. Skowlund and Frank L. Apperly

Soon after Harvey's discovery of the circulation of the blood it was recognized that gravity introduces a hydrostatic handicap when man assumes the vertical posture. This may embarrass the circulation sufficiently to induce faintness and even syncope. Since the blood vessels are elastic and distensible, the vertical posture gives rise to a redistribution of blood and causes fluid to accumulate in increased amounts in dependent parts. In consequence, the volume of the effective circulation may be reduced seriously.

Hydrostatic circulatory insufficiency or gravity shock is observed frequently enough in the practice of physiatrics to warrant review of the mechanisms known to be concerned in its development. Two bodies of evidence suggest that the circulation may be the weakest link in the evolutionary adaptation of man to an orthograde stance. The first of these is the high incidence of signs and symptoms of circulatory insufficiency elicited in the early stages of ambulation following injury or disease. Included among these are the familiar phenomena of orthostatic hypotension, tachycardia, dyspnea, edema, vertigo and syncope. Other evidence of the severity of the strain placed on the physiological machine by the vertical posture is the multiplicity of reflex aids called into play when it becomes necessary to compensate for the orthostatic reduction in effective circulation. Only a function of great biological significance would be so well protected. Although of negligible importance *per se*, hydrostatic circulatory insufficiency may be a serious handicap to the early rehabilitation of the disabled.

The gravity shock seen at the bedside or in the outpatient clinic may be due to the considerable peripheral dilatation elicited by the physical treatment administered, to paresis or paralysis of the antigravity muscles of the weight bearing limbs, to weakness of the anterior abdominal wall, or to reduction in the efficacy of reflex cardiovascular-respiratory adjustments. The latter are among the most important physiologic automatisms which should be understood by the physical therapist. They are the compensatory mechanisms by virtue of which the venous return, and thereby the minute volume of the heart, are adequately maintained in spite of the hydrostatic handicap of gravity.

The Mechanism of Gravity Shock. Hill and Barnard[1] placed reflex splanchnic vasoconstriction foremost in the line of defense against gravity shock and immediately contiguous to it, the respiratory pump. Reflex narrowing of the capacious splanchnic bed prevents excessive pooling of blood in the great vessels of the abdomen. This is aided by a taut anterior abdominal wall and the rhythmical descent of the diaphragm which accompanies breathing. Both augment intra-abdominal pressure and enhance venous return. An increase in respiratory rate and amplitude is another important automatic concomitant of the vertical stance.[2] The negative pressure normally present in the intrathoracic cavity thus is increased, both as to magnitude and frequency of alteration, and the thorax assumes an enhanced intermittent aspiratory action. Under its influence the intrathoracic veins expand and narrow in rhythmical succession.

It long has been recognized that the intermittent contraction of the muscles of the weight bearing limbs constitutes a subsidiary pump of considerable importance in the maintenance of the circulation in the vertical posture. This has been emphasized by Hellebrandt and Franseen.[3] Yandell Henderson[4] first called attention to the importance of the venopressor mechanism. This, according to the concept of Henderson, is the prepotent force which maintains and varies the volume of venous return, adding itself to the *vis a tergo* transmitted through the arterial and capillary systems by the left ventricle. Thus, the depression of muscular tonus which accompanies disease may lead to a progressive decrease in the effective circulating blood volume.

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Acknowledgment: Credit is due Elizabeth Brogdon Franseen for invaluable assistance in the conduct of the large series of studies performed at the University of Wisconsin.

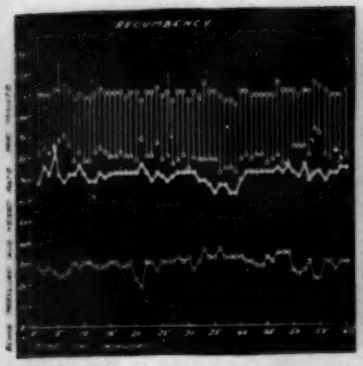

Figure 1—Heart rate and blood pressure observations during one hour of recumbency under the conditions of these experiments. In this and the following figures, systolic and diastolic pressure are joined by vertical lines which represent the magnitude of the pulse pressure. The solid circles (triangles in Figs. 15 and 16) represent heart rate. The circles at the bottom of the chart represent variations in pulse pressure.

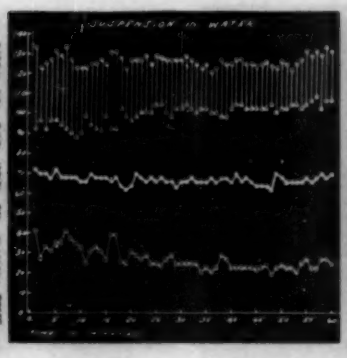

Figure 2—Heart rate and blood pressure response to one hour of vertical suspension in water at body temperature.

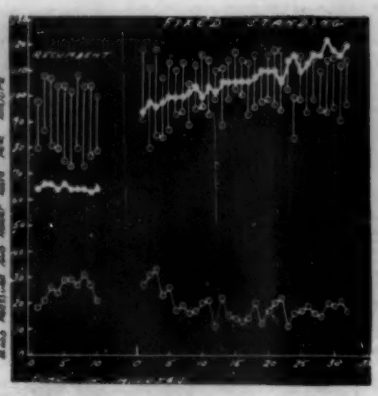

Figure 3—Heart rate and blood pressure observations with subject standing immobilized by extrinsic supports.

The object of the series of studies herein reported was to evaluate the relative importance of the milking action of the skeletal muscles in the prevention of gravity shock. Reasoning from first principles, this mechanical aid to venous return may be assigned a position in man equal in importance to the vasomotor and respiratory automatisms, in that it has the capacity of compensating for their failure.

Methods. All observations were made on normal adults familiar with the technics of physiologic research and trained to remain quiet and motionless for protracted periods of time. Most of the observations were made on women. The majority were young adults of superior physical fitness.

The study divides itself into two parts. The first series of 105 experiments performed on 21 different subjects were concerned with fundamental gravity shock observations and served to establish the conditions under which a controlled degree of experimentally induced orthostatic circulatory insufficiency might be used as a criterion for measuring the efficacy of the muscular pump. The majority of these represent previously unpublished data collected by one of us (F.A.H.) while affiliated with the Department of Physiology of the University of Wisconsin. Graded degrees of hydrostatic handicap were produced by maintaining the relaxed and immobile subject at various angles on a tilting table. The second series of 64 experiments on 9 subjects were designed to inhibit, augment or simulate the squeezing action resulting from reflex or volitional increase in muscle tonus; the majority of these were performed at the Medical College of Virginia.

The experimental room was dark, warm and quiet. The subject assumed a relaxed and comfortable supine position on the tilting table. Many of the experiments were performed with the subject in the postabsorptive state, that is, 12 to 14 hours after the last meal. Following preliminary stabilization at least one-half hour in duration, heart rates were determined by precordial auscultation. These were counted for 30 seconds out of every minute without interruption. Careful note was made of all variations in the quality and rhythm of the heart sounds, these being among the most reliable prodromal signs of circulatory failure. Weakening of the heart sounds, paroxysms of tachycardia, extreme sinus arrhythmia, extra systole, cardiac standstill and bradycardia were accepted as signals for terminating observations in the shock-inducing posture. In many of the experiments, pulse rates were counted by radial palpation as an added check on the condition of the subject. The color of the nail beds and mucous membranes were observed for signs of cyanosis. The respiratory rate was counted only if there was obvious hyperpnea. The occurence of sighing or dyspnea was recorded as well as other evidences of ischemia of the higher centers, such as "graying" or "blackout". Arterial blood pressures were determined at 60 second intervals, using the auscultatory method of Korotkoff. In the protracted preliminary experiments the cuff of the sphygmomanometer was inflated rapidly by compressed air to minimize venous stasis and congestion. All cardiovascular-respiratory observations were synchronized and the data for any given series of experiments were obtained by a well trained and relatively constant team of observers. In the interests of clarity, the methods utilized to augment, inhibit, and simulate the squeezing action

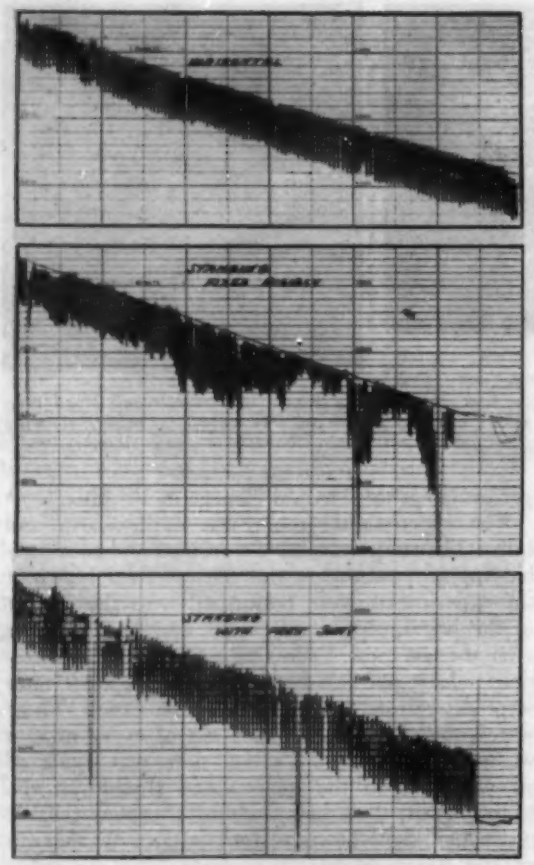

Figure 4—Spirometer records illustrating the effect of gravity shock on respiration. Breathing was markedly accelerated in rate. During the terminal phases of the middle record the subject was on the verge of syncope and breathing was of the Cheyne-Stokes type.

of the skeletal muscles will be described briefly in association with the presentation of results.

Results and Their Interpretation: (1) Preliminary exploratory studies. Control observations were made with the subject lying relaxed and motionless in the horizontal position for 60 minutes. As illustrated in Figure 1, heart rate and blood pressure remained at approximately the same level. The skeletal muscle pump was inactive and gravity was essentially without effect on the circulation. To reproduce these conditions in the vertical posture, the subject was suspended motionless in a tank of water at body temperature. To keep the extremities from floating, lead weights were attached to the wrists and ankles. Weight unopposed by the upward thrust exerted by the water was supported by a Sayre head sling. Twenty-four experiments of this type were performed. They ranged in duration from 20 to 60 minutes. Immersion in water, under the conditions of these experiments, virtually nullifies the hydrostatic effect of gravity. The circulation was maintained almost as adequately during the 60 minutes of vertical suspension as in recumbency (Fig. 2). The mean heart rate was slightly lower and considerably less variable than in recumbency. The only significant change observed was the slight gradual elevation of diastolic pressure throughout the period of suspension. There was no suggestion of vasomotor collapse.

Since muscle action could not be eliminated satisfactorily by suspension on land, it was reduced to a minimum by firm immobilization in the vertical posture using mechanical restraints which in no way interfered with the aspiratory action of the thorax or respiratory variations in intra-abdominal pressure. In this position evidences of circulatory insufficiency promptly occurred (Fig. 3). Diastolic pressure rose and pulse pressure fell, oscillating between 10 and 20 mm. Hg. much of the time. The heart rate rose steadily, climbing to a rate roughly twice that of recumbency by the time the experiment was terminated, 32 minutes after fixation in the vertical posture. Respiratory distress was occasionally acute (Fig. 4). The static contraction of the anti-gravity muscles may have given mechanical support to the distensible vein walls, limiting the pooling of blood in dependent parts, but it failed to prevent entirely the progressive decrease in effective circulating blood volume.

In the final experiments of the preliminary series, the normal massaging effect of involuntary postural contraction was given full sway (Fig. 5). The eyes were closed and the standing position was relaxed and comfortable. Compensation for the hydrostatic effect of gravity was much better than it had been in a rigidly fixed stance, the vertical posture being maintained for 60 minutes without discomfort and

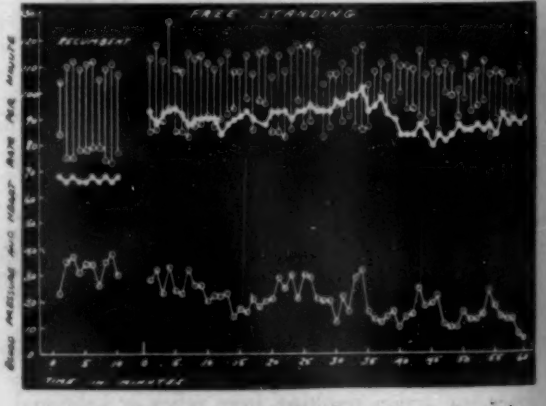

Figure 5—Heart rate and blood pressure observations during relaxed and comfortable standing.

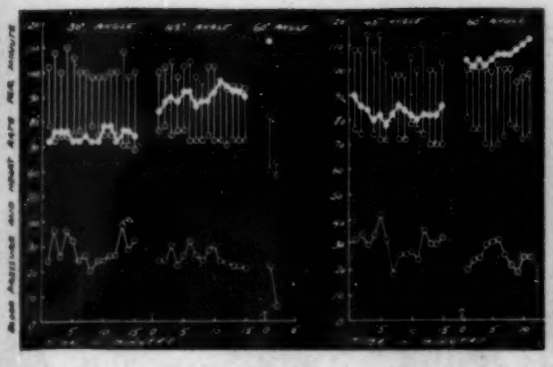

Figure 6—Heart rate and blood pressure observations demonstrating improved response to graded degrees of gravitational stress with repetition of the strain imposed on the circulation.

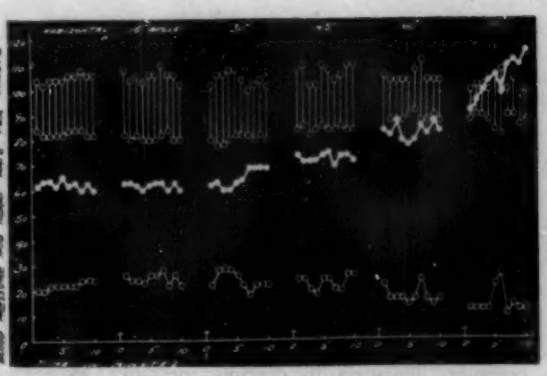

Figure 7—Heart rate and blood pressure response to a progressive increase in hydrostatic handicap.

without evidence of the progressive acceleration in heart rate which, in our experiments, always preceded collapse. The restorative effect of postural sway on respiratory rate and amplitude is illustrated graphically in Figure 4. Thus, we were able to demonstrate that verticality *per se* has no marked effect on the circulation, that orthostatic circulatory insufficiency is due to the hydrostatic effect of gravity, and that the muscle pump plays a significant supportive role.

(2) The production of graded degrees of orthostatic circulatory insufficiency. The determination of the critical angle at which incapacitating gravity shock appears was made on 10 young adult women. The two experiments illustrated in Figure 6 were performed on the same subject on different days. The subject was moved passively from the horizontal to the angles designated. The difference in response demonstrates the facility with which this subject (F.A.H.) became inured to the hydrostatic effect of gravity by simple repetition of the strain imposed. Not all subjects respond so rapidly. For example, it required more than a month of training before subject H.V.S., who is asthenic in habitus, could tolerate even moderate degrees of hydrostatic handicap without paroxysms of tachycardia. Subsequently, H.V.S. could endure the 70 degree angle for 30 minutes without serious discomfort.

To determine the commonest critical angle at which signs and symptoms of circulatory insufficiency occur, observations commenced with the subject in the horizontal on a table which was tilted progressively by 15 degree increments, each position being maintained for 10 minutes with 60 seconds elapsing between successive tilts. Figure 7 is a typical record. The most striking effect was on heart rate which increased sharply as the vertical posture was approached. Beyond the 45 degree angle diastolic pressure rose significantly. This was sometimes much more striking than in the record selected for demonstration. Systolic pressure did not begin to fall until the 75 degree angle was reached. In this position the subject was on the verge of syncope. Fainting occasionally occurred at

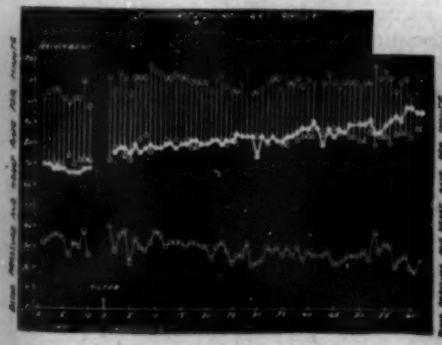

Figure 8—Heart rate and blood pressure response to a mild degree of hydrostatic handicap.

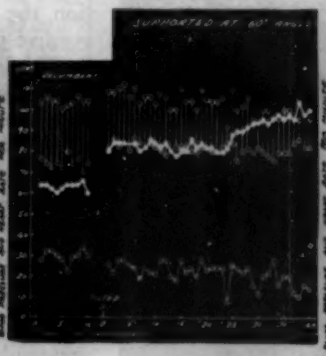

Figure 9—Heart rate and blood pressure response to a moderate degree of hydrostatic handicap.

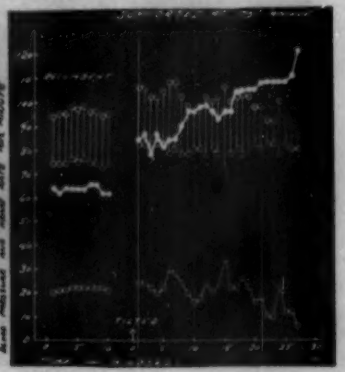

Figure 10—Heart rate and blood pressure response at the critical shock-producing angle.

the 60 degree angle. That the handicap imposed by gravity becomes progressively more difficult to meet is indicated clearly in the data presented. The evidence suggested that the duration of maintenance at any angle might be a factor of importance; that is, slight embarrassment, long continued, would become gradually more difficult to meet. Accordingly, the ability to offset the hydrostatic effect of gravity at various angles was studied. The duration of tolerance at the 45, 60, and 75 degree angles was observed. The experiment was terminated when collapse threatened. This was evidenced by great acceleration in heart rate, a falling systolic pressure, elevation in diastolic pressure, excessive diminution in pulse pressure, pallor, sweating, dyspnea, and signs of distress. Figures 8, 9 and 10 demonstrate that the changes are more acute and come on more rapidly as the motionless posture becomes increasingly vertical. Thus, by simple prolongation of the exposure to gravitational stress, the circulatory system may be subjected to reproducible degrees of strain beyond its compensatory powers. The objective signs of circulatory insufficiency which result are so repeatable that they may be taken as criteria against which to evaluate the supportive or recuperative powers of measures believed to aid peripheral circulation.

(3) Simulating the restorative effect of the natural operation of the muscle pump. The preliminary exploratory observations had indicated that the gentle intermittent massaging effect of the involuntary postural contraction of the antigravity muscles is sufficiently restorative to prevent the occurrence of orthostatic circulatory insufficiency. To evaluate the importance of the muscle pump in the prevention of gravity shock, physical therapy measures which simulate the squeezing action of muscular contraction and which can be varied at will were employed.

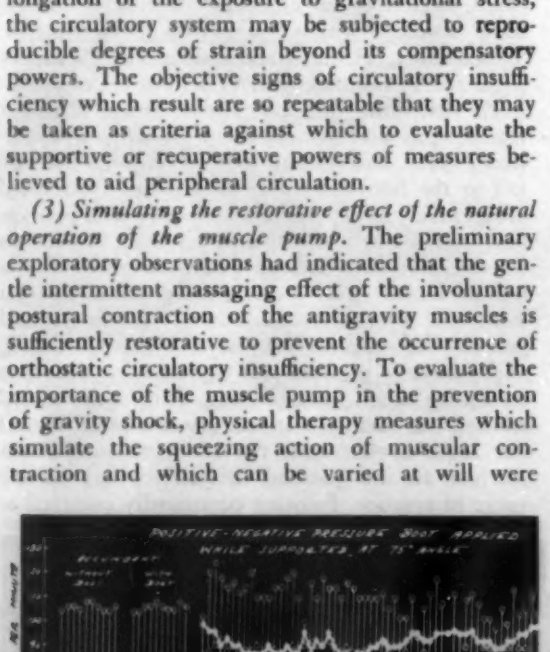

Figure 11—The restorative effect of the suction-pressure boot applied to one leg of a subject in a shock-producing posture.

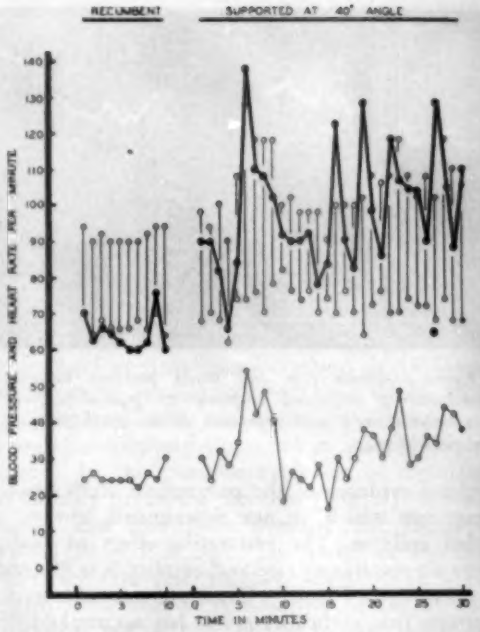

Figure 12—Paroxysms of tachycardia and great variations in blood pressure observed in a subject of asthenic habitus in response to mild hydrostatic handicap.

a. The suction-pressure boot. Devices designed to develop intermittent suction and pressure have long been used in the treatment of peripheral vascular disease. By placing a foot rest inside the positive-negative pressure boot it could be used when the subject was standing or tilted to any angle desired. Sixteen experiments of this type were performed on 8 subjects. After adjustment of the boot the subject was allowed to stabilize in the horizontal position. Then basal observations were made. With the subject still in the horizontal position the suction-pressure boot was turned on. A positive pressure of 45-50 mm. Hg., maintained for 5 seconds, was alternated rhythmically with a negative pressure ranging from 0 to 30 mm. Hg. which lasted for 25 seconds. After basal observations had been made with the boot in operation the subject was tilted passively to an angle known to be incapacitating if maintained for a sufficient interval of time. By comparing Figures 10 and 11 it will be seen that this had a distinctly beneficial influence on venous return. The suction-pressure boot permitted the subject to tolerate the critical angle for 60 minutes whereas postural syncope had occurred previously in less than one-half hour. Two subjects failed to respond. Both were tall and thin and exhibited hypotension in the horizontal posture. One, H.V.S., to whom reference has already been

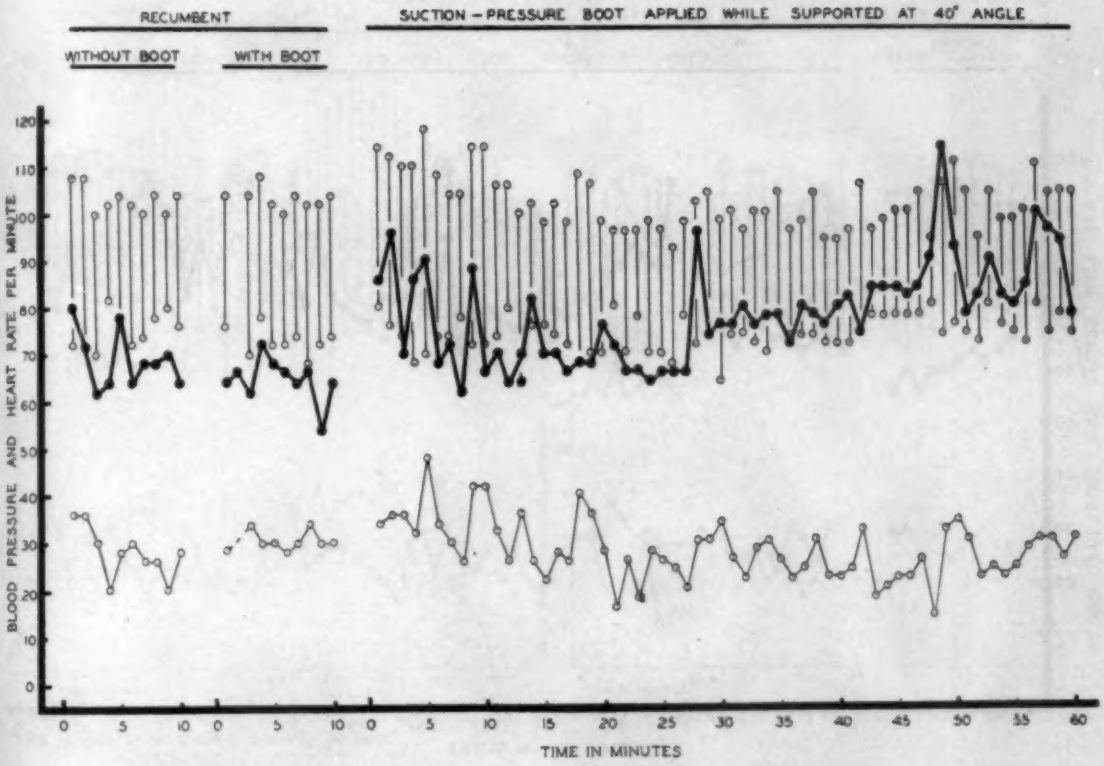
RECUMBENT
SUCTION – PRESSURE BOOT APPLIED WHILE SUPPORTED AT 40° ANGLE
WITHOUT BOOT
WITH BOOT
BLOOD PRESSURE AND HEART RATE PER MINUTE
TIME IN MINUTES

Figure 13—Restorative effect of the suction-pressure boot applied on the subject illustrated in Figure 12.

made, responded gradually to neurovascular training. While still reacting poorly to very mild hydrostatic handicap (40 degree angle), the influence of the suction-pressure boot was observed. The results are presented in Figures 12 and 13. The extreme lability of the heart rate and blood pressure of H.V.S. are not unlike the cardiovascular responses of the convalescing patient. The recuperative effect of mild intermittent pressure applied to one leg is evident. Approximately one month later the subject could tolerate a 70 degree angle with the boot in place (Fig. 14). When the boot was turned off, heart rate promptly rose. The data herein presented confirm the deduction made from the preliminary exploratory observations, to wit: that small intermittent changes in the pressure applied to the blood reservoirs in the leg are of critical importance in combating the hydrostatic effect of gravity on the circulation.

b. Electrical stimulation. After a long series of preliminary experiments, a suitable technic was developed which permitted painless electrical stimulation of the major muscle groups of the lower extremities. Most satisfactory results were obtained with the surging interrupted direct current of alternating polarity[5] (Burdick Morse Wave Generator). Current intensities up to 40-50 ma. were well tolerated and the optimal rhythm was 20 stimuli per minute. At the highest intensities used, the anodal and cathodal surge were equally effective.

The technic of electrical stimulation adopted was a modification of the so-called "faradic boot" used by Storms at the Toronto Workman's Compensation Board Clinic. The electrode pads consisted of spiral binders which were applied bilaterally from the foot to the groin. In some of the experiments the "boot" was split, leaving the knee joint free. The binders were made from four layers of muslin cut on the bias and stitched together. These were thoroughly soaked in hot saline and applied rapidly with a firm and even pressure. Either ribbon or cuff electrodes were used. They were held in place by Ace bandages applied over a spiral binder of oiled silk. The latter was essential to prevent drying of the electrode pads during protracted periods of observation. In some experiments the dispersive electrode consisted of a wide belt of Crooke's metal applied over a stockinette girdle thoroughly soaked in hot saline, and held in place with a many-tailed Scultetus binder.

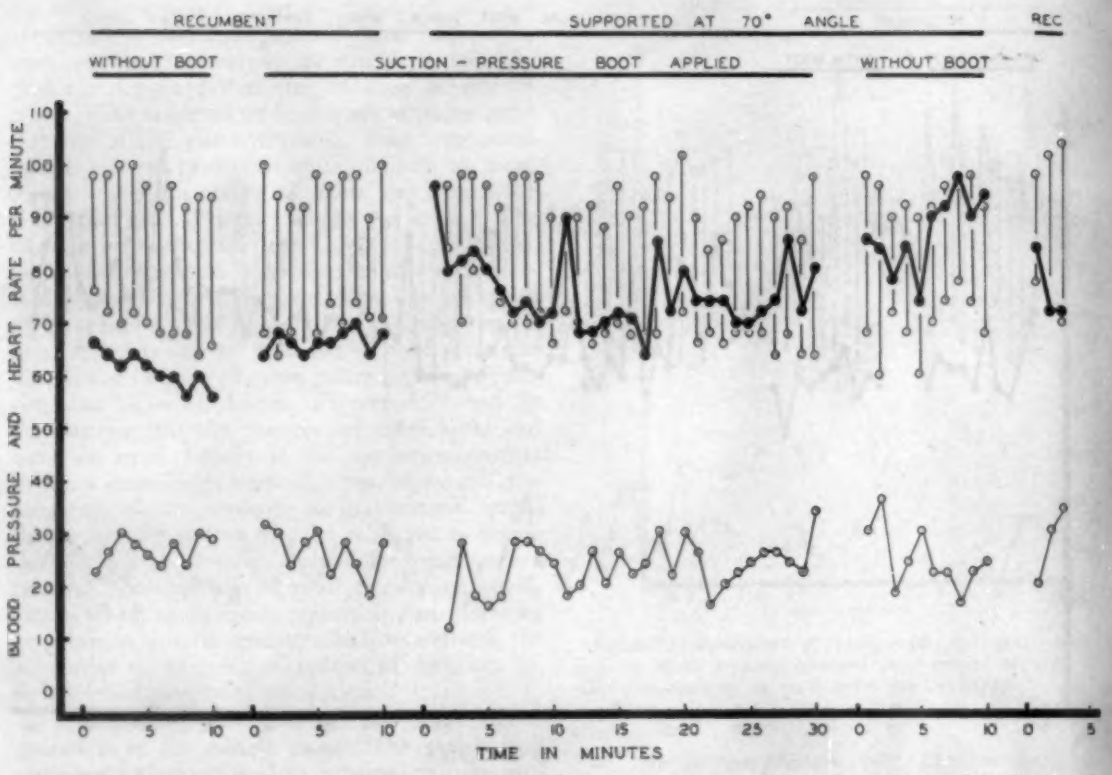

Figure 14—Heart rate and blood pressure observations demonstrating response of the subject illustrated in Figures 12 and 13 to neurovascular training.

This application permitted inclusion of the gluteal muscles in the contraction pattern.

Electrical stimulation was applied either in repetitive short bouts or continuously during the interval when the subject was held at a shock-producing angle. The rhythmical muscular contraction thus elicited had a markedly restorative effect, elevating the pulse pressure, reducing the heart rate, clearing the sensorium and alleviating the subjective distress of the individual in gravity shock. The current produced by the clinical equipment available for electrical stimulation was not without considerable effect on sensory receptors. Since emotional response to the sensations associated with the treatment might, in part, account for the reversal of the signs accompanying gravity shock, control experiments were run to evaluate this factor. No significant change in the cardiovascular response to the hydrostatic effect of gravity occurred when the so-called slow sinusoidal current was used (uninterrupted surged galvanic current of alternating polarity). This current elicits a strong burning and prickling sensation without motor response. Thus, the restorative effect of electrical stimulation may be attributed to the muscular response induced and not to psychic reaction to the procedure.

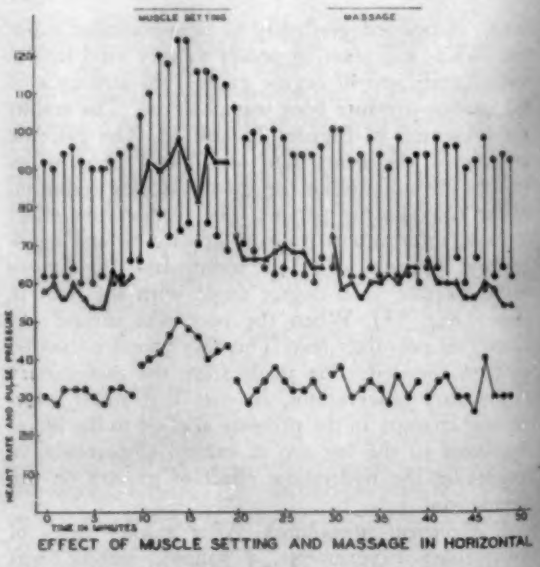

Figure 15—Heart rate and blood pressure response to "muscle setting" and massage with subject recumbent.

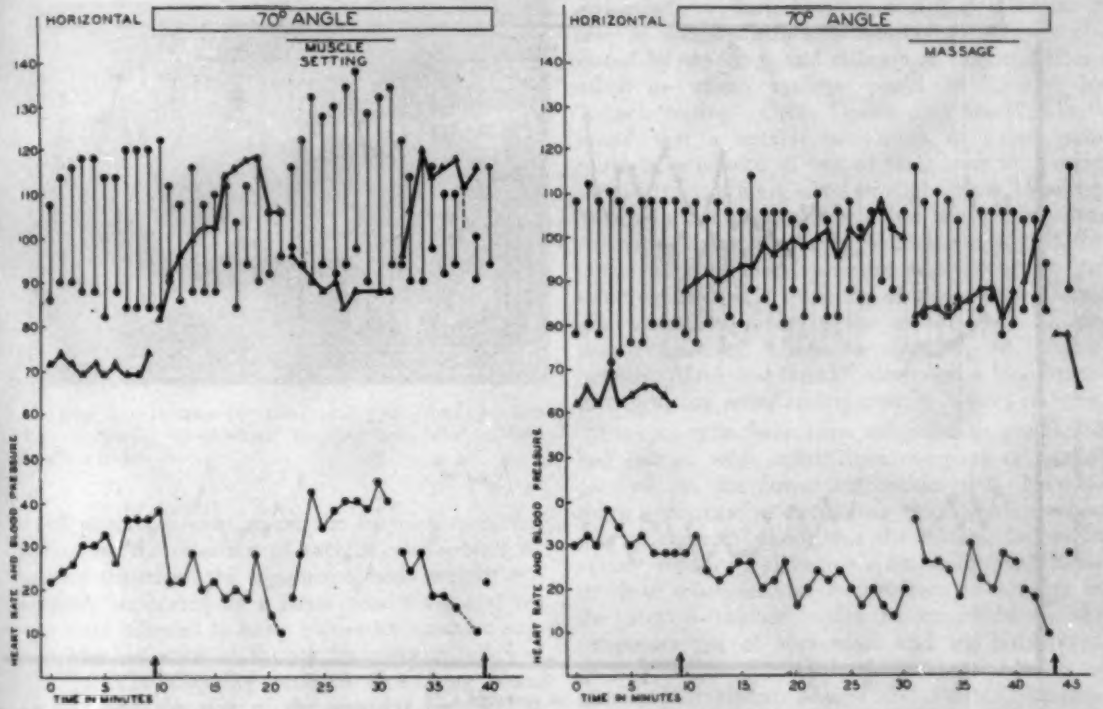

Figure 16—Experiments performed on different days illustrating restorative effect of "muscle setting" and massage with subject in a shock-producing posture.

Since the binders used in applying the stimulating electrodes in themselves prevent pooling of blood in the lower extremities, control experiments were performed also to evaluate this variable. The leg binders delayed the development of gravity shock but did not prevent wholly the cardiovascular changes characteristic of this syndrome. That they helped maintain the status quo after the termination of a prolonged bout of electrical stimulation was demonstrated unequivocally by the rapid development of severe circulatory insufficiency when the binders were removed while the subject was still in the shock-producing position following electrical stimulation.

In toto 26 experiments of this type were performed after the methods had been standardized. These data will be presented elsewhere by one of us (F.L.A.) in connection with a clinical study of the use of electrical stimulation for the treatment of traumatic shock, prevention of postoperative shock, and venous thrombosis.

c. "Muscle setting" and massage. Muscles may be contracted voluntarily and rhythmically without producing motion of the joints crossed. This so-called "muscle setting" is a moderately severe exercise which causes considerable elevation of blood pressure and heart rate even when performed in the horizontal position, as is illustrated in Figure 15. When introduced under conditions of impending orthostatic insufficiency, "muscle setting", limited to the antigravity extensors of the lower extremities, promptly alleviated all signs and symptoms of gravity shock (Fig. 16).

Deep effleurage of the leg and thigh, administered bilaterally by two operators massaging in unison, had the same effect (Fig. 16). Rapid collapse followed cessation of both "muscle setting" and massage. Fifteen experiments of this type were performed. Voluntary "muscle setting" and massage appeared to be the most effective of the various recuperative aids observed. Figure 17 illustrates the dramatic response of subject H.V.S. to these procedures. In spite of the great technical difficulties of administering massage consisting of stroking from the ankle to the groin of a subject supported on a tilting table adjusted to the 70 degree angle, this procedure was remarkably effective.

(4) Augmenting gravity shock. Mateef and Petroff[8] applied the term gravity shock to the vasomotor collapse which comes on when a post-exercise pooling of blood in the lower extremities is added to the hydrostatic burden of the vertical posture. Subject R.H.T. performed very severe

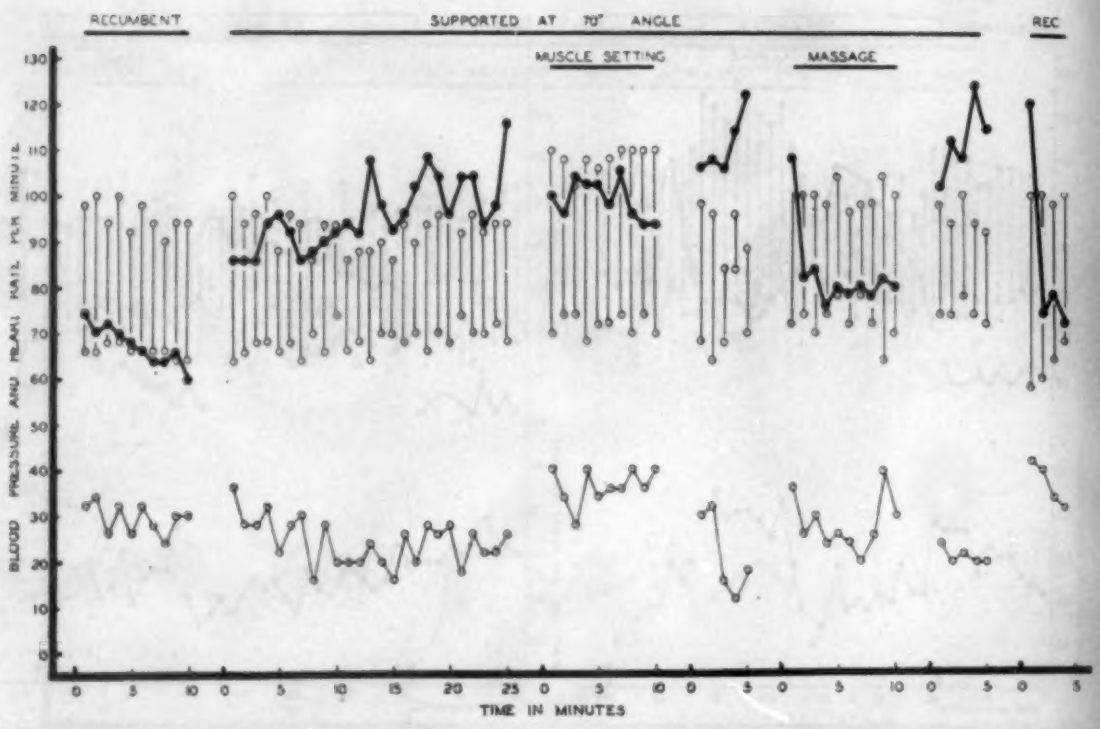

Figure 17—Comparison of restorative effect of "muscle setting" and massage. Observations made consecutively and without interruption.

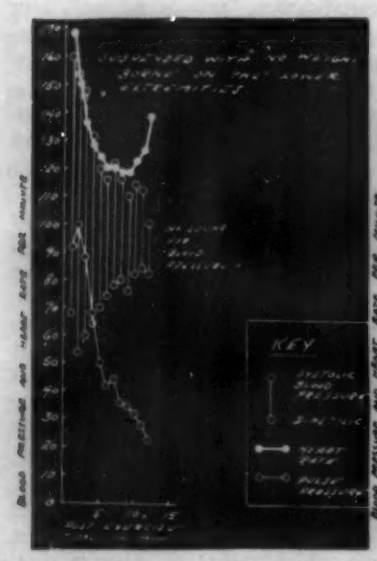

Figure 18—Heart rate and blood pressure observations demonstrating rapid collapse following severe anaerobic exercise.

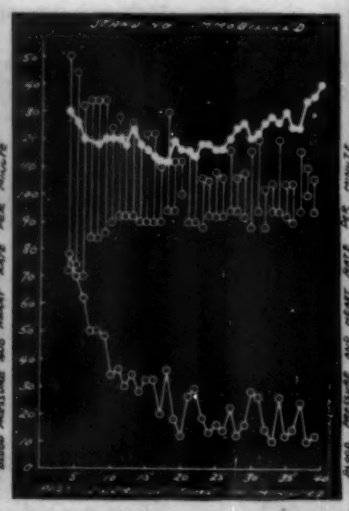

Figure 19—Heart rate and blood pressure response of subject in a rigidly fixed vertical stance following exercise.

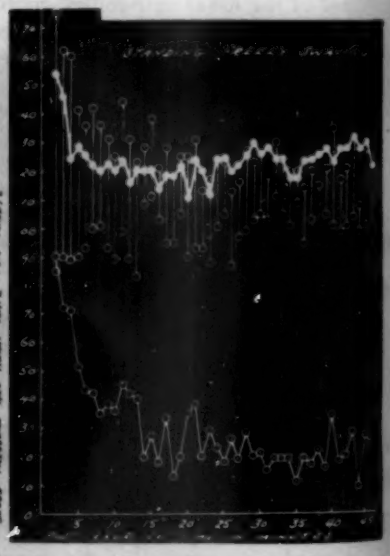

Figure 20—Restorative effect of postural contraction of the antigravity muscles following severe exercise.

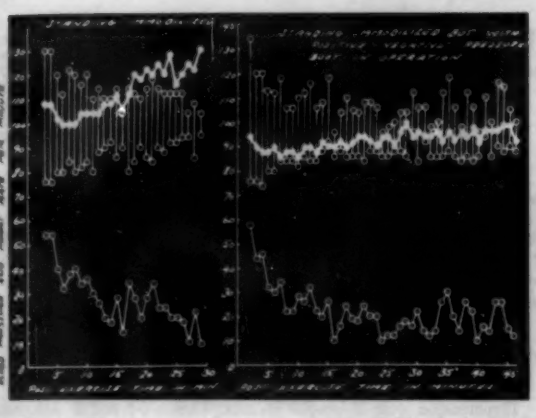

Figure 21—Postexercise heart rate and blood pressure response during immobilized standing with and without suction-pressure boot.

rapid anaerobic exercise on the bicycle ergometer. Following the cessation of exercise, the subject remained seated on the ergometer; body weight was partially supported by a Sayre head sling and the legs were allowed to hang motionless without support. As indicated in Figure 18, collapse followed quickly. The disparity between circulating blood volume and the size of the vascular bed was so great that effective circulation through the head-end of the organism was impossible. When, after exercise, the subject was given the benefit of resistance to the expansion of the distensible vessels by assumption of a rigidly fixed stance, the secondary rise in heart rate and diminution in pulse pressure indicative of impending collapse were much delayed (Fig. 19); when given the benefit of the milking action of postural sway, post-exercise gravity shock did not occur (Fig. 20). A similar series of experiments performed by subject F.A.H. demonstrate, in Figure 21, the restorative effect of the suction-pressure boot applied to one leg following exercise.

Discussion. Orthostatic hypotension is a recently recognized syndrome first reported by Bradbury and Eggleston.[7] It is characterized by marked weakness on standing, associated with dizziness. Systolic pressure falls abruptly to shock levels but the heart fails to accelerate in response to the hypotension. Syncope supervenes if the patient does not lower the head or assume a recumbent position. The various methods proposed to combat this defect in man's response to verticality are applicable to the control of the physiological orthostatic circulatory insufficiency under discussion. Allen and Magee[8] reported that pressure cuffs applied to the thighs decreased the hypotension when this could not be controlled with the use of an abdominal support. Hughes and Yusaf[9] report a case in which distressing symptoms could be obviated by walking, and Allen and Magee cite another in whom syncope could be averted by "muscle setting". Croll, Duthie and MacWilliam[10] found that a notable alleviation of hypotension could be produced in one of their cases by having the patient execute a series of slight, slow, shuffling movements. They postulated that afferent impulses emanating from the limbs were concerned in the pulse rate and blood pressure adjustments to the standing posture. Immobility of the lower extremities seemed to them to be at the crux of the pathogenesis of orthostatic hypotension. Subsequently, Alam and Smirk[11] described a blood pressure elevating reflex arising from voluntary muscles.

Patients who have been subjected to protracted bed rest or who suffer from complete or partial paralysis of the lower extremities may have so sharp a decrease in circulating blood volume when they attempt to stand, that the relative failure in venous return may become a major limiting factor in their rehabilitation. Resumption of activity in the vertical posture might be expedited by the temporary use of abdominal and leg binders especially when the ability to augment tonus is restricted or absent. Mateef and Petroff[12] demonstrated the value of bandaging the legs of patients with pathological loss of muscle tone. Gravity shock also is prone to occur if extensive peripheral dilatation is present, such for example as that associated with Hubbard tank treatments in water above body temperature. Widespread peripheral vasodilatation may also accompany regional heating. Thus, patients subjected to vigorous thermotherapy are susceptible to gravity shock if cooling and circulatory readjustments are not allowed to occur before the assumption of an upright stance. Cognizance of the limitations of man's ability to compensate for the hydrostatic effect of gravity on the circulation is essential for the good management of the patient with a pathological diminution in muscle tone.

SUMMARY AND CONCLUSIONS

One hundred and sixty-nine experiments were performed on normal adult subjects in a study of gravity shock concerned primarily with the evaluation of the relative importance of the muscle pump in the prevention of experimentally induced orthostatic circulatory insufficiency. A variety of physical therapy procedures were utilized to combat circulatory stasis of hydrostatic origin. In their mechanical effect these simulate the squeezing action of the normal contraction of skeletal muscles. The evidence presented supports the following conclusions:

1. Verticality *per se* has no marked effect on the circulation when the hydrostatic effect of gravity is nullified by immersion in water.

2. Orthostatic circulatory insufficiency during passive standing is due to the inability of normal cardiovascular - respiratory compensatory mechanisms to combat stasis when this encroaches significantly on the effective circulating blood volume.

3. The muscle pump plays a significant supportive role in the prevention of gravity shock.

4. The suction-pressure boot, massage, volitional "muscle setting", and electrical stimulation capable of eliciting the repetitive contraction of large muscle groups simulate the mechanical effect of the normal muscle pump and play a supportive or restorative role when administered during experimentally induced orthostatic circulatory insufficiency.

5. Attention is drawn to the clinical importance of gravity shock in the management of conditions which affect various phases of man's compensatory adjustment to this physiological phenomenon.

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Physical Therapy and Nursing

(Continued from page 11)

physician for examination and recommendation for treatment she is playing a large part in the program of preventive medicine (preventive surgery).

Occasionally the physical therapist in the field is asked by the public health nurse to go with her to a home and make suggestions as to ways and means of getting an individual in and out of bed, or into a chair. The physical therapist can add much to the in-service training of the public health nurse by giving this instruction along with the precautions to be observed in the handling of patients and by giving explanations as to why a patient cannot do certain things, such as why a patient with weak abdominals and weak triceps has difficulty coming to a sitting position in bed. Instruction in crutch walking and the use of canes along with the precautions to be observed can readily be included in an in-service training program as all individuals do not receive both public health nursing and physical therapy services.

The best results in a field program can be obtained only by close cooperation and interchange of ideas between all services involved.

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SCHOOLS APPROVED FOR TRAINING PHYSICAL THERAPISTS

By Council on Medical Education and Hospitals of the American Medical Association

Name and Location of School	Medical Director	Technical Director	Entrance Requirements[2]	Length in Months	Classes Start	Tuition	Certificate, Degree, Diploma
CALIFORNIA							
Children's Hospital, Los Angeles	Samuel S. Mathews	Sarah S. Rogers	a-b-d	14	Sept	$300	Cert. or Degree
College of Medical Evangelists, Los Angeles[1]	F. B. Moor	R. Wm. Berdan	a-b-c-d	12	Sept	$225	Cert. or Degree
University of Southern California, Los Angeles	J. N. De Lamater	Charlotte W. Anderson	a-b-d[3]	12	Sept	$496	Cert. or Degree
University of California Medical School, San Francisco[1]	Lucile M. Eising	Margery Wagner	d-e	12	Sept	$220[4]	Cert. or Degree
Stanford University, Stanford[1] (Palo Alto)	Wm. Northway	Lucille Daniels	a-b-d[2]	12	Jan June	$523.30	Cert. or Degree
COLORADO							
University of Colorado Medical Center, Denver	Harold Dinken	Mary Lawrence	a-b-d	12	Sept	$300	Cert. or Degree
ILLINOIS							
Northwestern University Medical School, Chicago	John S. Coulter	Gertrude Beard	a-b-d	12	Oct	$400	Cert.
IOWA							
University of Iowa Medical School, Iowa City	W. D. Paul	Olive C. Farr	e	12	Sept	$200	Cert.
KANSAS							
University of Kansas School of Medicine, Kansas City	Donald L. Rose	Lilyan G. Warner & Ruth Monteith	a-b-c[2]	12	Feb Sept	$80[4]	Cert. or Degree
MASSACHUSETTS							
Bouve-Boston School of Physical Education, Boston	Howard Moore	Constance K. Greene	H.S.	36	Sept	$500 yr.	Degree
Simmons College, Boston	Wm. T. Green / Arthur L. Watkins	Janet B. Merrill	a-b-d	16-36	Sept	$550	Cert. or Degree
Boston University College of Physical Education for Women: Sargent College, Cambridge 38	Kenneth Christophe	Adelaide McGarrett	H.S.	36	Sept	$435 yr.	Cert. or Degree
MINNESOTA							
University of Minnesota, Minneapolis[1]	Miland E. Knapp	Ruby M. Green	H.S.	36	Oct	$530[4]	Degree
Mayo Clinic, Rochester	Earl C. Elkins	Helen Belknap	a-b-c	12	Jan July	None	Cert.
MISSOURI							
Washington University School of Medicine, Barnes Hospital, St. Louis[1]	Sedgwick Mead	Beatrice F. Schulz	c	2 yrs	Sept	$400 yr.[9]	Degree
St. Louis University School of Nursing, St. Louis[1]	Alexander J. Kotkis	Sr. Mary Imelda	H.S.	36	Jan Sept	$300	Degree
NEW YORK							
Albany Hospital, Albany	John W. Ghormley	Catherine Graham	a-b-d	12	Sept	$250	Cert.
Columbia University, New York City[1]	Wm. B. Snow	Josephine L. Rathbone	a-b-c	1 or 2 yrs	Sept	$450 yr.	Cert. or Degree
New York University School of Education, New York City[1]	George G. Deaver	Elizabeth C. Addams	a-b-d	12	Sept	$589	Cert or Degree
NORTH CAROLINA							
Duke University School of Medicine, Durham[1]	Lenox Baker	Helen Kaiser	a-b-d	15	Oct	$300	Cert.
PENNSYLVANIA							
D. T. Watson School of Physical Therapy, Leetsdale[1]	Jessie Wright	Kathryn Kelley	a-b-d	12	Oct	$300	Diploma
Graduate Hospital, University of Pennsylvania, Philadelphia[1]	George M. Piersol	Dorothy Baethke	a-b-e	12	Sept	$300	Cert.
TEXAS							
University of Texas School of Medicine, Galveston	G. W. N. Eggers	Ruby Decker	a-b-d	12	Jan	$149[4]	Cert.
VIRGINIA							
Baruch Center of Physical Medicine of the Medical College of Virginia, Richmond[1]	Walter J. Lee	Susanne Hirt	a-b-c[3]	12	Sept	$351[4]	Cert. or Degree
WISCONSIN							
University of Wisconsin Medical School, Madison[1]	Harry D. Bouman	Margaret Kohli	a-b-c[3]	12	Sept	$120[4]	Cert. or Degree

[2]Courses are so arranged that any of the entrance requirements will qualify students for training. a = Graduation from accredited school of nursing; b = Graduation from accredited school of physical education; c = Two years of college with science courses; d = Three years of college with science courses; e = Four years of college; H.S. = High School graduation.
[1]Male students are admitted.
[3]High school graduates accepted for a four-year course leading to A.B. degree.
[3]High school graduates accepted for four-year college course.
[4]Nonresidents charged additional fee.
[5]Certificate granted by Children's Hospital Society; degree granted by University of California at Los Angeles.
[9]Tuition reduced second semester of second year.

Editorials and News

Change is the essence of growth and life depends upon its continuation, but it is usually so gradual as to escape particular notice. Yet occasionally some development occurs which is remarkable. Such a change is the passing of the bimonthly edition of THE PHYSICAL THERAPY REVIEW. With this issue, January 1949, the new policy of a monthly issue is inaugurated. The changes will by no means cease, but this seems one worthy of comment.

It is particularly gratifying to those who have been in any way responsible for the development of the REVIEW, from its inception to the present, to see the monthly issue an actuality. As our association has grown in stature, the need for corresponding development of its official publication was felt. The increase in editorial duties which is caused by more frequent publication made it expedient to separate the business office and move it to the National Office of the Association in New York City. This is a step we have long been contemplating for the purpose of more efficient procedure.

There are advantages in issuing the REVIEW monthly of which we hope you will soon become aware. It will be possible to publish a greater number of scientific papers within the year; news items and notices will be more up-to-date and therefore more such material will be used; and it will be possible to use the REVIEW to report association activities, thus eliminating the News Letter.

In making this advance, however, we are assuming the responsibility for continuing it. Success in this will depend upon the cooperation of our members. You can help us by being ready with suggestions and by taking a personal interest in the REVIEW. It is your magazine and we hope you will be proud of it.

Good Physical Therapy Is Ethical Physical Therapy

One good thing about an editorial is that it will not be censored and the writer can blow off steam. The publisher can disclaim any responsibility for it and any troubles ensuing will be the writer's privilege to clean up.

For many years, erroneous impressions have persisted in the minds of laymen *and* physicians regarding what physical therapy really is and why now, all of a sudden, these therapists are getting in the hair of hospital administrators, hospital staffs and the medical world in general.

Well, let's see why and what can be done about it.

In the first place, a considerable amount of very inferior, so-called physical therapy has been on the loose which has not really been too beneficial either for the recipient patient or the good name of the profession.

Possibly the following recommendation given a therapist who was applying for a position will clarify what we mean. The letter said in part: "Miss ——, whom we have been training is a very industrious, common sense sort of a woman and she can boil, bake, knead and blister patients with the best of them but she should be somewhat supervised with regard to cases about which there might be some question."

We have all encountered the "production line" method of physical therapy where quantity was the principal output and quality necessarily suffered. It is pretty much generally agreed that a good, well trained physical therapist, given adequate space and equipment can treat some 15 to 18 ordinary, general cases in an 8-hour working day and do a first class job. We realize, of course, that this does not include the more difficult and greater time consuming types such as polio, cerebral palsy and paraplegics.

Another disturbing feature has been the not uncommon disproportion between the use of electric and mechanical gadgets run on the "time clock turn 'em on and off" system and the more time consuming massage and therapeutic exercise therapies, for example. There is no intention, implied or otherwise, to minimize the importance and value of the former types of therapy as they are definitely indicated in certain conditions, but they should not be employed to the exclusion of the latter modalities which has not infrequently been the case.

This has not by any means always been the fault of the therapist as can readily be appreciated by reviewing a large number of prescriptions for therapy as written by the referring physician. One prize which is ever to be remembered was: Diagnosis-cholecystitis; treatment requested-diathermy to ankle! At least the ankle was specified, though which one was apparently left to the discretion of the therapist, who of course referred the patient back to the physician with a request for more ex-

plicit instructions.

This brings up the very important consideration of the ethics of the physical therapy profession which require that the therapist carry out the physician's prescription, rather than that the therapist diagnoses, prescribes and treats a patient. No ethical therapist will undertake any therapy without being completely informed by the physician as to diagnosis, precautions to be exercised, objectives to be attained and type of therapy desired. The physician prescribes—the therapist carries out the orders. The therapist, of course, may and should question an obviously improper prescription, just the same as a pharmacist is bound to do, as this is perfectly ethical and can be done diplomatically.

We do not mean to be facetious or opinionated, but it is better to come out in the open with suspicions all of us have had for some time and see if we can find a remedy which will be for the benefit of all concerned. If nothing else this may start some argument—polite or otherwise—which, if it results in constructive ideas, will be worthwhile.

In the American Hospital Directory of 1948, page C-32, we find the 1947 survey of 6,173 hospitals reporting that 2,215 hospitals are noted as having a Physical Therapy Department. This is 35.9 per cent of the number reporting. This information, without more specific data as to staffing, space and equipment is not much of a guide as to the quality of physical therapy available at the reporting hospitals. A more detailed survey would be helpful to supply the rather pertinent data lacking. With such information at hand a more accurate picture as to the needs of various sized hospitals could be obtained. The planning for new hospitals to be constructed would be greatly aided by knowing space requirements for the various adjunct services.

Now let us get to work and think, having in mind the one objective of how the best interests of the patient can be served by physical therapy.

—A. W. REGGIO, M.D.

Conference—
Boston, June 19-23, 1949

I stood on Brimstone Corner last evening watching the sun touch the gilded dome of the State House and a knowing Boston Common pigeon spoke to me. As a proper Bostonian I listened with courteous attention, although I must admit that I was somewhat surprised that he spoke to me. Mind you, I was not astonished that a Common pigeon spoke, for they have a world-wide reputation for uncommon ways. I was surprised and flattered that he had singled me out of the crowds hurrying along Tremont Street.

"Have you heard," he said, "that the American Physical Therapy Conference is coming to the Copley Plaza Hotel in June?" He went on to tell me that the formal program would be announced later, but he assured me that I could expect a fine educational program as usual. "Time will be arranged for visits to the physical therapy departments of our hospitals," he remarked. "You know, the Massachusetts General, the Peter Bent Brigham, the Children's Hospital, and others." He stood for a moment with a reflective air. "Ah, how I envy visitors to Boston," he sighed, "there is so much for the visitor to enjoy." With that he bid me goodbye, and with that jaunty attitude that marks a Common pigeon from the rest of the breed, he sauntered away, leaving me with that thought to consider.

When you come to visit us in June, you will be aware of fascinating contrasts of a city rich in the background of history and culture and yet a city of busy commercial activity. From the moment you begin your journey from the train or plane, you will savor the charm that makes Boston so distinctive among American cities. You cannot be in Boston long without becoming acutely aware of its historical atmosphere. The American Revolution here is a reality as it is in no other American city, save possibly Philadelphia. It is not an exaggeration to say that the proper Bostonian has a keener remembrance for the struggle for colonial liberties than he has for later conflicts. The tiniest urchin in North Square will willingly entertain you with details of Paul Revere's House or the Old North Church with the assurance of a Harvard professor. Bostonians, hurrying along Tremont

Copley Plaza Hotel

Street, are never too busy to cast a glance toward the Old Granary Burying Ground, just to make sure that James Otis and John Hancock have not been moved from that hallowed spot. You may stroll up and down the narrow, twisting streets of the city, half obscured by modern stores and office buildings, and you will see signs that evoke memories of school books and the ringing names of men and deeds: the Boston Massacre, the Boston Tea Party, Bunker Hill, the Old South Meeting House, Benjamin Franklin, Samuel Adams. Not far from Boston are Plymouth Rock and the sites of early Pilgrim settlers, Salem and its dark memories of witchcraft, Lexington Green where once "the embattled farmers stood," and quiet Concord Bridge with its famous Minute Man Statue. There is an ancient Colonial charm that will send away the historically minded visitor with memories of gracious old mansions, inns and taverns, battlegrounds and monuments to last him for many a day.

But perhaps you say, "I do not care for past events. I want to relax after the conferences. What can Boston offer me?" My answer is that Boston in early summer has a lazy, pleasant air that just invites loafing. Take a stroll through the elm-bordered intricate paths of the Common and watch the people; gaze at the colorful flower displays in the Public Garden; hazard a ride on the tranquil waters of the Public Garden pond in one of the graceful swanboats. For lunch you might try one of the seafood restaurants that overlook the harbor where the tang of the salt air will stir your appetite. Wander through the quaint cobble streets of the Louisburg Square district of Beacon Hill, and if your rambling is done in the early evening, watch the lights come on along the Esplanade across the river in Cambridge. If it is food that you want, do not be misled by the old jingle of the "home of the bean and the cod." Boston takes pride in its eating places: Locke-Ober's tucked away in Winter Place, Durgin Park's in the Market district, Daniel Webster's favorite Old Union Oyster House, Jake Wirth's, and many others. If it is music that you want, what more delightful way to pass the time than to attend the Pops Concerts at Symphony Hall, an unforgettable evening of lilting music in an atmosphere reminiscent of days gone by. Or, should your taste run to more vigorous activity, go to Fenway Park or Braves Field and watch staid Boston really become excited when its baseball teams are in the first division. As any Common pigeon could tell you, there is no need to miss important speakers on the program.

The lights at the ball parks turn night into day for the fan armed with his inevitable bag of peanuts and score card. Summer theaters, cool roof gardens for dancing, moonlight excursions down the harbor—what more could a visitor desire?

The late George Apley once said, "No city can boast of a Museum like dear Mrs. Jack Gardner's." Only a Bostonian could speak of an Italian palace of priceless art treasures with the familiarity of that phrase. The Museum of Fine Arts is but a stone's throw from Fenway Court. Across the river in Cambridge are the indescribably beautiful flowers blown in glass. Bostonians have a peculiar pride in those Glass Flowers, and some natives are truly insulted if the visitor neglects them. For the more adventurous the artist colonies of Rockport and Provincetown may beckon. Nor is the lover of art obliged to stay indoors on the pleasant summer days. The white sails of Marblehead, the rocky coast of Gloucester, and the quiet coves of Cape Cod charm the eye and quiet the nerves. Picturesque gift shops and antique sales lure the traveler to linger awhile.

That wise old Common pigeon knew so well the enchantment of this region. He and I have known these pleasures for years. We want you to come to judge for yourself. Bostonians like to have their city enjoyed. You may have heard that "Lowells speak only to Cabots" but you will be delightfully surprised to find that Sullivans speak to everyone and Cabots speak to amazingly large groups. Plan to stay and visit. If you prefer, take the six weeks or three months course on Poliomyelitis offered by the Children's Medical Center. Tuition for six weeks is $100 and for three months, $150. Applications may be sent to Miss Janet Merrill, The Children's Hospital, Boston 15, Massachusetts.

Whatever you decide to do, Boston will welcome you warmly.

Semi-Annual Meeting of Executive Committee

The semi-annual meeting of the Executive Committee was held in New York City, December 10th through 12th. Those attending were Lois Ransom, President; Marguerite Irvine, Vice-President; Mary Haskell, Secretary; Margaret Kohli, Treasurer and Chairman of Program Committee; Mary Singleton, Speaker, House of Delegates; Dorothy Baethke, Director and Chairman of Committee on Education; Catherine Worthingham, Director; Barbara White, Educational Secretary, and Mildred Elson, Executive Secretary. In addition, the following committee chairmen and other members attended part of the sessions: Paul Campbell, Finance Committee; Floy Pinkerton, Public Laws; Lucy Blair, Interprofessional Relations; Jeanette Johnson, Exhibits;

Virginia Greenwood, Program, and Elizabeth Addoms, School Section.

There were in addition to routine business many items on the agenda which required considerable thought and deliberation. These included:

An Executive Committee Platform

A platform was adopted for the first time. This will appear in the February issue of the REVIEW.

Legislation

There was discussion of state legislation pertaining to physical therapists and policies concerning it. The Committee on Public Laws will explore and develop this.

There was discussion of national legislation—Compulsory Health Insurance in particular. It was felt that we should support voluntary plans rather than a compulsory plan through federal legislation.

Revision of Personnel Policies

It was pointed out that Federal Civil Service salaries have been up-graded to meet the rising cost of living. It also was felt that national personnel policies should be kept broad in character and that the personnel policies as published by the Association should be revised accordingly. It was further recommended that chapters should be encouraged to establish policies in their own areas.

Student Membership

Policies and development of a more dynamic approach, particularly at the chapter level, were discussed. As members of both national and chapter they are entitled to all the rights and privileges except to hold office or vote. The number of student members who did not transfer to active membership indicates a need for "on the spot" orientation by the chapters.

Student membership, it was pointed out, is a bargain if they elect to subscribe to the REVIEW. They receive national and chapter membership and the magazine for one dollar less than the subscription to the REVIEW alone.

A report by Miss Baethke pointed out that schools do not have capacity enrollment this year. A membership report for six months showed that with the number electing inactive membership and those dropped for nonpayment of dues (267) that any net gain in active membership will be very small this year.

Placement Service

The report showed that the ratio of positions to applicants as of October 31, 1948, was eight positions to one applicant. This, together with previous discussion on membership, the committee felt presented a very serious situation. It was felt that every effort must be made at both national and chapter level to effect a solution and every one must assist in a vigorous recruitment program not only to keep the present school enrollment at capacity but to allow for increased enrollment to meet present day employment demands.

1948 Polio Epidemic

There was considerable discussion regarding the personnel problems resulting from the disastrous 1948 polio epidemic. The "bottom of the barrel" has been reached in providing physical therapists for emergency work. In addition there were many professional problems concerning physical therapists and physical therapy personnel brought to the attention of the Committee. The National Foundation for Infantile Paralysis requested that the Association take over recruitment for emergency work in 1949. After discussion, in which the many problems of recruitment were fully discussed and recognized, it was voted to do so, to become effective May 1, 1949.

Polio Consultant

Mary Haskell assumes her duties as Polio Consultant, January 1949. During the months of January to May the whole problem of physical therapy service in emergency polio work will be studied in the field and in consultation with other agencies. Mary Singleton, who has recently been loaned to the North Carolina State Department of Health by Duke University to organize follow-up work, presented recommendations which were favorably received and which will be incorporated into the final plan which will be presented after May 1st. It was felt that many of the professional problems discussed were not peculiar to polio emergency areas and that the proposed study program will be of great benefit to the profession.

Conference

The 1949 program plan for the Annual Conference was presented by Margaret Kohli. This will appear in the February issue of the REVIEW. Registration is Sunday afternoon, June 19th, and sessions at the Copley-Plaza will end Thursday but there will be clinical demonstrations and open house at departments in the Boston area all day Friday. The School Section will meet on Saturday, June 25th.

There will be an evening for presentation of movies and slides by members and one morning devoted to research papers. Announcements concerning these appear elsewhere in the REVIEW.

Alumni reunions: Due to the difficulty both in time and in obtaining facilities, a new plan is to be tried out this year. Instead of luncheons it is suggested that the groups get together for cocktails before the banquet and to sit together at the ban-

quet. There will be appropriate signs on the tables to indicate the schools. Further details will appear in a later REVIEW.

Sections (See Article VIII of the Bylaws.)

Policies regarding the formation of sections were established:

1. That there be a minimum of 50 members.
2. That a proposed section have a trial period of two years before being granted full status.
3. That sectional meetings not be held concurrently with annual conference meetings.
4. That sections be considered work conferences and that participants on the program come preferably from its own membership. Outside speakers may not be financed by the Association. The sections may suggest to the Program Committee of the National Association a speaker, or speakers, whom they feel would be of interest to all the members.

American Registry of Physical Therapy Technicians

At the Annual meeting of the American Congress of Physical Medicine an amendment to its bylaws to eliminate the word technician from the title of the "American Registry of Physical Therapy Technicians" and to provide for the appointment of two American Physical Therapy Association members to the Registry Board was presented. It did not receive favorable consideration by the members of the Congress. This was a disappointment to many as a Committee consisting of Doctor Krusen, Doctor Wright and Doctor Moor of the Registry Board and Catherine Worthingham, Jessie Stevenson and Mildred Elson of the American Physical Therapy Association had recommended this action. It is expected that this Committee will continue to function and to further discuss mutual problems.

The Physical Therapy Review

There was discussion of the transfer of the business management of the REVIEW to the National Office which has just been effected. The need for more advertising was emphasized. It was pointed out that it will take about six months to adjust contracts from a bimonthly to the monthly publication. The need for the News Letter it was felt was now eliminated. All notices and personals will appear in the REVIEW. Unless there is need for a communication of a confidential nature to the members the News Letter will not be issued.

It was felt that there should be wider use of the editorial columns of the REVIEW to inform the membership and others of Association policies.

Resignation of Barbara White

It was with great regret and with sincere appreciation of her work that the Committee accepted Miss White's resignation as Educational Secretary, effective July 1, 1949.

Motion Pictures

Time is being set aside for motion pictures or slides which would be of interest to physical therapists. Any member or organization who has a movie or slides may apply to the Chairman, Margaret Kohli, University of Wisconsin Medical School, Section of Physical Medicine, Madison 6, Wisconsin, for inclusion in the program. All applications must be filed by March 15, 1949.

The applications must contain the following information:

1. Title and brief description of the subject matter covered in the film or slides.
2. Size of film—8, 16 or 32 mm. Silent, sound. Black and white or colored.
3. Size of slides—2x2, or 3x4. Kodachrome or black and white.
4. Number of slides and length of time needed to show them. Length of film and time necessary to show it.
5. Name of organization and individual responsible for material.

The Program Committee will select those films and slides which in their judgment will be of greatest interest to the audience and which will fit in with allotted time. Only films and slides thus selected will be shown.

Public Health Section

At the Annual Meeting of the House of Delegates a motion was made that there be a section composed of physical therapists in Public Health Agencies. A further request was made that a notice be inserted in the REVIEW to ascertain the interest in the section.

By public health agencies it is meant both voluntary and public agencies such as: Visiting Nurse or other home visiting agencies; state, county, or city health departments; state crippled children's services, etc.

In order to ascertain the interest in such a section it is requested that any member interested send a card to the National Office stating his interest in the organization of a section, his present employment and whether he is attending conference.

A luncheon meeting at Conference has been suggested to further discuss organization of the section, and plans for it must be made in advance. It is requested therefore that all cards be sent in by March 1, 1949.

A.P.T.A. Insignia

Insignia cuts are now available, for the chapters of the American Physical Therapy Association

which wish to use them in changing their stationery, etc., from the National Office, 1790 Broadway, New York 19, N. Y.

My Visit to England

Evelyn Anderson May, formerly Secretary of the American Physical Therapy Association, has been in England since the summer of 1944. During that time she has worked at various centers in England and is now working half-time at Brompton Hospital—a chest center. Evelyn is very enthusiastic about her work there and particularly praised Miss Joyce Reed, Supervisor of Physical Therapy.

She was very much interested in the manual recently released by the Veterans Administration on chest—"Physical Therapy for Thoracic Surgery Patients—Tuberculous and Nontuberculous" which was prepared by Florence Linduff, although her name does not appear on it.

We had a wonderful time visiting and catching up on the news and gossip. The Mays—Dr. Philip and Evelyn—made my stay in London most pleasant. They subleased a "flat" for me in the Nell Gwynn House in Chelsea. We had our ration books supplemented by generous gifts from the Mays and their friends. Food in England is still carefully rationed and even in the restaurants you may order only a three course meal. One does not realize our abundance until visiting in another country where food is short. One misses the amount of proteins—meat—cheese—eggs as well as butter —candy and other sweets to which we are accustomed. Coffee is plentiful although the blends are different from ours. Tea is still rationed.

England is now an exporting country. For example, all good woolens and china as well as Scotch are exported and cannot be purchased by the people living there. Cigarettes are scarce and high—approximately 70c a pack.

London is a very interesting city. There are still many evidences of the destruction particularly in the East End which was heavily blitzed early in the War. We did get around a bit to some of the historical places—St. Pauls, the Abbey, Tower of London, Hyde Park, Windsor Castle, the Old Curiosity Shop, etc.

The Saturday after the Congress, Miss Neilson, Secretary of the Chartered Society, drove us to Brighton. We rode by Epsom Downs and through lovely old English villages. This driving on the wrong side of the road, however, is hard on your nervous system. Crossing the street on foot also is hazardous as you look the wrong way through habit and suddenly you realize your life is in danger.

London has excellent transportation. The underground is, I must admit, cleaner than New York subways. The cars seem more modern and more spacious. Trams go everywhere and the cost is according to distance. It might be a thrupence or a tupence half penny (pronounced hay penny). We loved the little taxi cabs and they too are very reasonable and not nearly as noisy as the Paris taxis.

Evelyn does have a bit of an English accent but it's very easy to acquire since one tends to try to express oneself in terms commonly used there.

We hope before too long that the Mays will be returning to the United States.

—MILDRED ELSON

Chapter Activities

New York Chapter: For the opening meeting in October, Dr. Herbert Kent, a Fellow of The National Foundation for Infantile Paralysis, spoke on "A New Institute of Rehabilitation." The meeting was held at Cornell Medical College.

The New York State Association for Crippled, Inc., had a demonstration conference on "Functioning Programs for the Disabled" in New York State at the Lenox Hill Hospital in November.

Carolina Chapter: A tuberculosis symposium, sponsored by the Veterans Hospital, Oteen, North Carolina, was held as a September meeting. Dr. George D. Wilson, V. A. Consultant, Dr. Ralph E. Meyer, Chief of Tuberculosis, Veterans Hospital, Dr. J. D. Murphy, Chief Surgeon, V. A. Hospital, and Mrs. Ila J. Amrhein, Chief Physical Therapist, Veterans Hospital, were the speakers for the symposium.

Wisconsin Chapter: Dr. Lewis Danziger, Milwaukee Sanitorium, spoke on "Recent Advances in Psychiatry" at the November meeting.

Eastern Missouri Chapter: Dr. Florence Mahoney, Chief of Physical Medicine and Rehabilitation, Kennedy Veterans Hospital, Tennessee, was guest speaker for the October meeting. Dr. Frederick A. Jostes, Consultant in Orthopedics, Veterans Hospital, Jefferson Barracks, presented a lecture on "Conservative Management of Low Back Pains and Possible Herniated Disc" at the November meeting. Dr. William B. Kunz, Geriatrist, will present a discussion on "The Treatment of Peripheral Vascular Diseases" for the December meeting to be held in St. Louis.

School Notes

Duke University School of Medicine:

The Division of Physical Therapy at Duke University School of Medicine is conducting a six months' graduate course in "Psychosomatic Aspects of Physical Therapy". The course was planned to

meet the needs of graduate physical therapists who wished to receive further instruction in patient management. The most significant part of the course is the practical work with the psychiatric patients who need physical therapy. Under guidance, the student develops a knowledge of how to reinforce the effects of the physical procedures with a proper appreciation of the emotional factors in the situation. The work is intensive and the personal contacts between the students and psychiatric staff are close.

New York University School of Education is offering a six weeks, 4 point course in "Rehabilitation of the Physically Handicapped," beginning February 9, 1949.

The course will be given at the Institute of Rehabilitation and Physical Medicine, 325 East 38th Street, New York, under the direction of Dr. Howard Rusk, Dr. Donald Covalt, Dr. George Deaver and Edith Buchwald. Enrollment is open to a limited number of qualified physical therapists who must meet the approval of the Curriculum Director, Elizabeth Addoms.

Tuition $15.50 per point.

Registration $3.00. Laboratory $2.00.

Apply to Elizabeth Addoms, Institute of Physical Medicine and Rehabilitation, 325 East 38th Street, New York 16, N. Y.

Northwestern University Medical School: A tea in honor of the sixteen students in the 1948-49 physical therapy class was held on November 7, 1948, at Wesley Memorial Hospital. The tea was given by the Northwestern University Physical Therapy Alumni Association.

The University of Texas announces a Postgraduate Course in Physical Medicine to be held February 28 to March 4, 1949, Medical Branch, Galveston. For further particulars, communicate with W. A. Selle, Director of Postgraduate Course in Physical Medicine, University of Texas Medical Branch, Galveston, Texas.

Scholarships

● *Physical Therapy:* The National Foundation for Infantile Paralysis has available physical therapy scholarships for men and women who need financial assistance to complete training as physical therapists in schools approved by the Council on Medical Education and Hospitals of the American Medical Association. Applicants must meet certain educational prerequisites and qualifications and must agree to accept employment under the supervision of a qualified physical therapist in an institution approved by the National Foundation for a year following the completion of training. The amount of each scholarship varies according to the financial needs of the individual student. For further information write to the Credential Secretary, National Foundation for Infantile Paralysis, 120 Broadway, New York 5, N. Y.

● *Cerebral Palsy:* The National Society for Crippled Children and Adults, assisted by grants from Alpha Chi Omega, National Sorority, continues to offer scholarships for special study in cerebral palsy. Eleven scholarships have been awarded thus far, and present plans provide for these awards to continue through 1950.

Physicians, physical and occupational therapists, speech therapists, nursery school teachers and other workers are eligible to receive these scholarships. For further information write to the National Personnel Registry and Employment Exchange, National Society for Crippled Children and Adults, Inc., 11 South La Salle Street, Chicago 3, Illinois.

Personals

● Dr. James P. Mennell recently has returned to Pasadena, California. During the month of October he gave a series of twelve lectures at Columbia University. Doctor Mennell was listed erroneously as a member of the staff of the Kabat-Kaiser Institute at Vallejo in one of its early announcements. He expects to be in California until next May when he will be returning to England.

● Augusta Stubbe, Consultant in Physical Therapy, Branch 2 (New York Area) for the Veterans Administration was married August 1948 to Mr. Frank Birosa of San Juan, Puerto Rico, and is now living in Puerto Rico.

● Mr. Owen W. Tester, formerly physical therapist at the Veterans Hospital, Bronx, New York, has been appointed to the position of Regional Consultant in Physical Therapy formerly held by Miss Stubbe.

● Helen M. Lutz has recently been returned to the United States after four years of duty in the South Pacific.

● Dr. Frances Hellebrandt and Sara Jane Houtz are in Europe visiting famous spas. A letter was recently received from them in Czechoslovakia. Doctor Hellebrandt asked that we send to the director of Charles University some of our scientific reprints.

● Edith Buchwald, N. Y. U. 1947, has recently been appointed as Supervisor of Rehabilitation courses at the Institute of Rehabilitation and Physical Medicine, New York University School of Medicine.

• Marie Maling of the Spastic Center, Children's Hospital, Melbourne, Australia, has been visiting cerebral palsy centers in the United States. Miss Maling was sent to England and to the United States by the Australian Red Cross.

Marriages:

Jean L. Collings of Portland, Oregon, is now Mrs. Jean C. White.

Ruth Madsen of Salt Lake City, Utah, is now Mrs. Ruth M. Ogilvie.

Barbara Ewing of Kansas City, Kansas, is now Mrs. Barbara E. Crews.

Jean Landis of Tucson, Arizona, is now Mrs. Jean L. Smith.

Robin Pace of Denver, Colorado, is now Mrs. Robert E. Simmons.

Elin Lagerquist of Arpin, Wis., to Mrs. C. L. Wiswald, Chicago, Ill.

Ruth Pulling of Sunmount, N. Y., is now Mrs. Albert L. Meier.

Evelyn Dettmer is now 1/Lt. Evelyn D. Armour, Ft. Sam Houston, Texas.

Winifred Ditto of Alhambra, California, is now Mrs. Winifred Gerling.

Beatrice Margaret Frederick of Oakland, California, is now Mrs. Beatrice Ferron.

Ruth Harris of Rochester, N. Y., is now Mrs. Ruth Gossin.

Robin Hess of Spokane, Washington, is now Mrs. Robin Peters.

Dorothy Miller of Grand Rapids, Michigan, is now Mrs. Dorothy M. Getz.

Rachel Nunley of Spartanburg, S. C., is now Mrs. Rachel N. Jennings.

Marjorie V. Pitt of Chicago, Illinois, is now Mrs. Marjorie P. Williamson.

Frances Wright of Redwood City, California, is now Mrs. Frances Sherman, Jr.

Florence Shipley of Wheaton, Illinois, is now Mrs. Florence Blanchfield.

May Niles of Tucson, Arizona, is now Mrs. May Watrous.

Jean Fylkin of San Francisco, California, is now Mrs. Jean McGinty.

Martha Musick of Kansas City, Missouri, is now Mrs. Martha Kenagy.

Elizabeth Zand of Flushing, New York, is now Mrs. Elizabeth Kellerman.

Mary Claire Lindley of Chicago, Illinois, is now Mrs. Claire Carroll.

The American Medical Association Interim Session

The Interim Session designed to meet the interests and fit the needs of the general practitioner seemed to fit the bill according to the American Medical Association daily bulletin issued at the Session. Approximately 300 physicians were registered.

Members of the American Physical Therapy Association participated in several exhibits and demonstrations. Miriam Rodenberger, Chief Physical Therapist at Jefferson Barracks, and her staff ably demonstrated chest exercises in the Veterans Administration exhibit under the direction of Doctor Knutson and Doctor Newman. Beatrice Schultz, Technical Director, Barnes Hospital, assisted Doctor Meade in an exhibit on physical medicine in general practice. She also participated in a television program on arthritis. Thelma Ruddy and Lucille Fitzpatrick assisted Doctor Polley and Doctor Erickson of the Mayo Clinic and Doctor Boyle of Ft. Thomas, Kentucky, in physical medicine in arthritis.

In the poliomyelitis demonstration Dr. Thomas Gucker III was assisted by Theresa Failon, R.N., and Shirley Cogland, physical therapist of the Children's Hospital, Boston, in the care of the poliomyelitis patient in the acute stage. Dr. Robert Bennett of Warm Springs, Georgia, was assisted by Helen Vaughn, physical therapist, and Charlotte Dutz, occupational therapist, both of Warm Springs, in the convalescent stage. Dr. Howard Rusk and Dr. Donald Covalt of New York University were assisted by Barbara White and Mildred Elson in the final rehabilitation stage. Catherine Worthingham was in charge of the demonstration and Dr. Sedgwick Meade was local chairman. The "patient" for the acute and convalescent stage was Ann Stewart, physical therapist at Jefferson Barracks. Three polio patients were brought in from Jefferson Barracks for the final rehabilitation stage of daily living. Good work by the Jefferson Barracks physical medicine department was evident by their effective demonstration of crutch walking and activities of daily living.

The Association also had its own exhibit and assisted with the exhibit on early and late rehabilitation of the hemiplegia with Doctor Rusk and Doctor Covalt. Members of the Eastern Missouri Chapter gave invaluable assistance in preparation for the exhibits, obtaining properties and in giving time to the exhibit.

The Chapter entertained the National Office staff members and Catherine Worthingham at dinner followed by an informal meeting at the Marine Hospital at Kirkwood, Missouri. Mary Safris, Secretary of the Chapter, is in charge of physical therapy there. Eastern Missouri members have lots of good ideas for development of their chapter and

physical therapy in their area. Our bet is they'll have a high batting average.

The Interim Session was a successful meeting judging by the keen interest of those attending in all the exhibits and demonstrations. The Association was privileged to have a part in it.

Physical Therapy in Public Health

A series of four articles pertaining to physical therapy in public health agencies has appeared recently in the *Public Health Nursing Journal:*

"Physical Therapy in a VNA," by Mary Macdonald—August 1948.

"Orientation of Physical Therapists in a Public Health Agency," by Louise Hayward—October 1948.

"A State Field Physical Therapy Program," by Norma Pfrimmer and Esther Gillette—November 1948.

"Physical Therapy in Public Health—Looking Toward the Future," by Jessie L. Stevenson—January 1949.

Reprints of these four articles may be obtained by writing to the Joint Orthopedic Nursing Advisory Service, 1790 Broadway, New York 19, N. Y.

American Occupational Therapy Association

The American Occupational Therapy Association, through its 1949 Convention Committee, invites all members of the American Physical Therapy Association to attend their 1949 Annual Convention to be held at the Book-Cadillac Hotel in Detroit, Michigan, August 23 to 27.

Certification of Artificial Limb and Brace Makers

To improve the professional standards of manufacturers of artificial limbs and braces, and the fitters employed by such firms, an American Board for Certification has been established in Washington, D. C., with headquarters at 336 Washington Building.

Three orthopedic surgeons and four leaders in the orthopedic appliance industry constitute the national board which will grant certification.

To be qualified for certification an applicant must prove that he has had at least four years of actual experience under proper supervision or two years of special training and one year of experience. In addition, the applicant must present the signatures of two physicians who state that he meets various other requirements. More than 100 firms and 200 fitters have already applied for certification.

New Members

The following are newly accepted members of the American Physical Therapy Association:

Curran, Gloria, 142 Broad St., Matawan, N. J.
Dexter, Helen K., 3548 Garfield Ave. S., Minneapolis 8, Minn.
Evans, Mrs. Marit P., Rt. 31, Box 365, Stockton, Calif.
Feldman, Martin, 32-23 170 Street, Flushing, N. Y.
Holland, Ruth, Olin, N. C.
Kelly, Mrs. Margaret Cop, 17 Deerfield Ave., Buffalo, N. Y.
Lenners, Arlene M., 199 North Ave., Wakefield, Mass.
Martin, Mary Sydney, 308 Harrison St., Easton, Md.
Miles, Elizabeth, 1590 Sutter St., San Francisco 9, Calif.
Price, Shirley, 153 Bell Ave., Piedmont, Calif.
Rayer, Leland T., 20703 Clare Ave., Maple Heights, Ohio.
Ross, Mrs. Charlotte D., Box 141, Sanitarium, Napa County, Calif.
Sosnowski, Margaret G., 4660 Sunset Blvd., Los Angeles 27, Calif.
Stafford, Mary, 462 Baughman Ave., Claremont, Calif.
Tolson, John S., 378 Holly Street, Apt. 4, Vallejo, Calif.
Weiss, Patricia Lou, 922 W. Charles, Champaign, Ill.
Wood, Mrs. Virginia F., 6359 Arbutus Ave., Huntington Park, Calif.

• Recent graduates and former student members of the following schools:

Barnes Hospital:
Shoulders, Dolores

Baruch Center of Physical Medicine, Medical College of Virginia:
Brown, Isadore
Matteson, Laura
Stankavitch, Lt. Anne M.

Boston University, Sargent College:
Weiner, Katherine S.

Children's Hospital:
Allen, Lois J.
Arnold, Helen E.
Badger, Virginia M.
Bertoglio, Marian
Cake, Nancy E.
Dahm, Margaret C.
Garcia, Gloria
Ramsey, Phyllis M.
Schwanberg, Carol
Walsh, I. Lucille
Ward, Nancy C.

Columbia University:
Easton, Marion W.
Messina, Rosaline R.
Rote-Rosen, Marilyn H.

Duke University School of Medicine:
Aymond, Allen H.
Baker, Edwina Frances
Bruton, Sue Alice
Horton, Jeannette M.
Huftalen, Beth
Hunt, Jean
Niehus, Lucile
Scheib, Susan Lou
Wooten, Plummer
Zarbock, Richard

D. T. Watson School of Physical Therapy:
Casey, Violet
Gwilt, Blanche T.
McGuinn, Mary K.

Graduate Hospital, University of Pennsylvania:
Goldstein, Avis Gloria
Klinetob, Carson W.
Reaney, Mrs. Eleanor

Mayo Clinic:
Beck, Ruth T.
Barhaug, Eleanor B.
Hobbs, Miriam R.
Olliver, John F.
Vickers, Virginia Ruth

New York University School of Education:

Corbitt, Theodore
Davis, Margaret de Baun
Dunlop, Elise M.
Giargiari, Raymond F.
Griboff, Charlotte
Kahn, Ethel
Little, Joe C.
Singe, Mrs. Elizabeth N.
Tester, Owen William
Randazzo, Mrs. Alice O.
Repkin, Arthur A.
Rivers, Gilbert

Northwestern University Medical School:

Bickel, Mary L.
Erickson, Jean M.
Gray, Geraldine E.
Traynor, Markine W.

Stanford University:

Newell, William E.

University of California Medical School:

Blair, Mary Jean
Bosworth, Mrs. Jean S.
Carroll, James F.
Gill, E. Patricia
Latham, Nancy
Marshall, Betty M.
Zanger, Claire M.

University of Iowa Medical School:

Davis, Agnes
Webb, Eulalia

University of Kansas School of Medicine:

Nelson, Evelyn

University of Southern California:

Allard, Marcella G.
Bullock, Ramona Jean
Underwood, Etta J.
Vetter, Hilda L.

University of Wisconsin Medical School:

Allen, Jean L.
Duffee, Mary Jane
Lyga, Patricia Ann
Woelfer, Jean B.
Yehle, Mary R.
Yoder, Patricia

• Newly accepted student members

Children's Hospital:

Ball, Beverly
Paul, Anita Marie
Rojaks, Augusta
Yucuchi, Mrs. Satoshi

New York University School of Education:

Babiak, Demetrius
Berenson, Henrietta
Brown, Arthur T.
Cantrell, Francis J.
Capecchi, John
Davidson, Lavinia M.
DePompeo, Victor
DeRosa, Anthony J.
Garson, Irvin S.
Hagelberg, Rita J.
Jones, Carlton L.
Kalman, Lazarus
Knowlton, Edna
Lefkowitz, Mortimer
Leventhal, Doris
Levy, Julian
Mark, Annette
McKethan, Doris E.
Metz, John Jr.
Moore, Edna E.
Morrocco, Salvatore W.
Psychoyos, Stacy
Sampson, Oscar C.
Schulman, Ruth

Northwestern University Medical School:

Berresheim, Frances M.
Bevan, Alda L.
Blitstein, Miriam
Case, Frances E.
Cestero, Graciela
Chase, Anita J.
Gardner, Josephine
Glick, Ariel M.
Jones, Margaret E.
Major, Jacqueline A.
McKown, Elizabeth R.
Santistevam, Alice L.
Schmugge, Dorothy
Schnake, Elizabeth
Stringer, Helen R.
Yeck, Ruth M.

Simmons College:

Cotter, Rosemary
Osgood, M. Ruth
Watts, Nancy T.

University of California Medical School:

Bertolli, Margaret
Bordegaray, Yvonne
Botts, Ernestine
Dilley, Marguerite
Erickson, C. Juanita
Fleming, Bonnie J.
Goodman, Alice V.
Ives, Loraine
Jouvenal, Jeanne M.
Knecht, Harry G.
McDaniel, Margaret J.
Mann, Ernest Lee Jr.
Murota, Kay
Norton, Sally-Lee
Pfluger, Harold P.
Tolf, Ruth Ann

University of Southern California:

Alcock, Jane C.
Bateman, Verla M.
Kikuchi, Dorothy
Nigro, Mrs. Rosemarie M.
Riley, Elsie A.
Scott, Audrey J.
Wilkinson, Harriet

University of Wisconsin Medical School:

Boldt, Lola Mae
Boyum, V. Kenneth
Gallagher, Mrs. Jewell
Heikkila, Hilda
Latsch, Lois
Leahy, Rosemary
Lonnborg, Kenneth
Martin, Patricia A.
Meiselwitz, Mary H.
Motelet, Mary M.
Nusbaum, Sara J.
Pfleger, Betty
Prior, Margaret M.
Rogahn, Gloria C.
Rubnitz, Cecelia E.
Schlinkert, Bernadine D.
Siggelkoe, Marcia O.
Stutzman, Leon
Vereka, Joseph J.
Watson, Jean A.

• Newly accepted associate members:

Andrew D. Johnson, M.D., Dept. of Physical Medicine, Vets. Adm. Hosp., Wichita, Kans.

Sylvanius A. Morton, M.D., 8301 N. Allen Lane, Milwaukee 11, Wis.

Ray Piaskoski, M.D., 3343 N. Dousman St., Milwaukee 11, Wis.

Women's Medical Specialist Corps

The following is an extract from a letter received by Colonel Emma E. Vogel, Chief of the Women's Medical Specialist Corps, from Major Felie W. Clark, Supervising Physical Therapist in the Far East Command:

"This morning I saw the 'Dawn come up like Thunder' as Kipling describes it 'out of China 'cross the Bay.' We had left Clark Field, Stotsenburg in the Philippine Islands at 0100 hours in a troop carrier. At approximately 0500 hours we saw vivid red color appearing in the sky and then a golden streak of light appeared from the banks of black cloud. In a few minutes the sun appeared right up from the base of the streak. Looking down, I felt as if I were over snow-covered mountains instead of the ocean. The white clouds were solid beneath us. Though flying at about 10,000 feet, we appeared to be standing still in a fairy land; thousands of miles of grandeur, of peace, of infinite beauty.

"At 0700 hours we put on our May Wests (life preservers) and our parachutes and fastened our seat belts in preparation for landing. As Okinawa is of coral formation, the colors in the surrounding waters are vivid. There are delicate hues of green, blue, and brown contrasted, or complemented with the pure white spray

and foam of the breakers on the beaches. We circled the field long enough to give us a splendid view and also to adjust our ears to the loss of altitude. The pilots are young men, but they certainly handle air craft with skill and confidence.

"A week ago today we took off from Haneda Air Field, Tokyo, for Manila. We visited the 10th General Hospital first, then we went up to Clark Field to visit the 20th Station Hospital. It was a great pleasure to see our friends again; some who were there on our last trip and others whom we had known in the States and had just arrived in the Far East Command. Everyone is working very hard, but they still have time and energy to play in the evening.

"Never will I forget the view, the bay, the tropical moon, the flowers, and the rolling countryside. I wish everyone could experience the joy of a satisfying existence: to work hard during the day at an interesting job and then play in such thrilling surroundings."

Index to Current Literature

Anterior Poliomyelitis

The Response of the Quadriceps Femoris to Progressive-Resistance Exercises in Poliomyelitis Patients. Thomas L. DeLorme, Robert S. Schwab and Arthur L. Watkins. J. Bone and J. Surg., October 1948.

Treatment of Poliomyelitis: An International Symposium, Physiotherapy, November 1948.

Arthritis and Rheumatism

Foundation, G. Member: American Physical Therapy Asso- Physiotherapy, September 1948.

Bone and Joint Diseases and Injuries

Roentgen Therapy of Bursitis. Fred M. Hodges and Randal A. Boyer. Virginia Med. Monthly, November 1948.

Cerebral Palsy

The Early Diagnosis of Cerebral Palsy. William F. Dunham and Eirene Collis. Physiotherapy, October 1948.

Dermatology

Skin Lesions in Persons Exposed to Beryllium Compounds. J. Industrial Hygiene and Toxicology, July 1948.

Treatment of Lupus Vulgaris with Large Doses of Calciferol: Clinical and Biochemical Appraisal: Part I: Clinical. J. T. Ingram and S. T. Anning. British J. Derm. and Syphilis, May 1948.

Electrotherapy

An Electronic Controller of Volleys in Electrical Stimulation. Alexander Mauro and Samuel P. W. Black. Yale J. Biology and Med., July 1948.

Electric Convulsive Therapy in Mental Disorders Associated with Childbearing. David A. Boyd, Jr. and Dewitt W. Brown. J. Missouri State Med. Assoc., August 1948.

Electroshock Therapy, Clinical and Electroencephalographic Studies. A. Mosovich and S. Katznelbogen. J. Nervous and Mental Dis., June 1948.

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The Response of the Quadriceps Femoris to Progressive-Resistance Exercises in Poliomyelitic Patients. Thomas L. DeLorme, Robert S. Schwab and Arthur L. Watkins. J. Bone and J. Surgery, October 1948.

Eye, Ear, Nose and Throat

Experimental Lenticular Opacities Produced by Microwave Irradiations. A. W. Richardson, T. D. Duane, and H. M. Hines. Arch. Phys. Med., December 1948.

Diathermy Treatment of Retinal Angioma. P. M. Lewis. Am. J. Ophthalmology, July 1948.

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Colles' Fracture. Bryan McFarland. Physiotherapy, October 1948.

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Thermal Gradients During Varying Body Temperatures: With Particular Reference to Changes During Application of External Cold in Patients with Noninfectious Fevers. Ludwig W. Eichna. Arch. Phys. Med., November 1948.

Physiologic Effects of Heat. Khalil G. Wakim. J.A.M.A., Dec. 11, 1948.

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Reiter's Disease: Report of Five Cases Including Two Successfully Treated with Hyperthermia. Edward W. Lowman and Robert J. Boucek. Annals of Int. Med., June 1948.

Food Intake as a Mechanism of Temperature Regulation. John R. Brobeck. Yale J. Biology and Medicine, July 1948.

Miscellaneous

Tentative Minimum Requirements for Acceptable Direct Reading Electroencephalographs. Council on Physical Medicine. J.A.M.A., Nov. 27, 1948.

Control of Air-Borne Infections in Nursery for Young Infants. I. Rosenstern. Amer. J. Diseases of Children, February 1948.

Study of Resuscitation from Juxtalethal Effects of Exposure to Carbon Monoxide. H. Schwerma, A. C. Ivy, H. Friedman and E. La Brosse. Occupational Medicine, January 1948.

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C. Titus. Med. Record, May 1948.

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The Physiotherapeutic Approach to Mental Disease. Anthony Austin. Physiotherapy, September 1948.

Physical Medicine

The Experimental Approach to Physiotherapy. L. J. Witts. Physiotherapy, November 1948.

Physical Medicine in Industry. E. H. Capel. Physiotherapy, November 1948.

REPRINTS AVAILABLE

One free copy of each scientific reprint (except the History of the American Physical Therapy Association, and the Anterior Poliomyelitis and Cerebral Palsy Issues of the REVIEW will be provided upon request to all members, students in the approved schools and libraries. A small charge is made as indicated for additional copies to members, students and libraries, and for all copies to nonmembers. The informational brochures are available to all without charge. To obtain reprints write: American Physical Therapy Association, 1790 Broadway, New York 19, N. Y.

PHYSICAL THERAPY, A SERVICE AND A CAREER

An illustrated brochure, describing the opportunities for a career in physical therapy, available scholarships and educational requirements for entering a school of physical therapy. (Made available through National Foundation for Infantile Paralysis funds.)

OUR ASSOCIATION

An informational booklet on the activities, scope and services of the American Physical Therapy Association.

PHYSICAL THERAPY

A question and answer article covering the usual queries received on physical therapy.

PHYSICAL THERAPY—*Suggestions for Prospective Students.*

Outlines the professional course of study for college students preparing for physical therapy.

PHYSICAL THERAPY SECTION: *Its Scope and Employment Opportunities.*

This consists of 12 articles by various contributors on physical therapy in a state crippled children's service, public health service, the cerebral palsy field, the Veterans Administration, the industrial clinic, a curative workshop, a large general hospital, a small general hospital, a children's hospital, crippled children's schools, the physician's office or clinic group and the psychiatric field.

ETHICS FOR THE PHYSICAL THERAPIST: *From the Point of View of the Medical Practitioner.*
HELEN HARDENBERGH, M.D.

APPROVED SCHOOLS OF PHYSICAL THERAPY

A list of schools approved by the Council on Medical Education and Hospitals of the American Medical Association.

THE PRESCRIPTION OF PHYSICAL THERAPY
JESSE WRIGHT, M.D.

CARE OF PATIENTS WITH INFANTILE PARALYSIS: *Correlation in the Nursing and Physical Therapy Services.*
CARMELITA CALDERWOOD HEARST (5c)

POSTURE TRAINING FOR ADOLESCENTS
CAROLYN BOWEN (5c)

PHYSICAL THERAPY AND CHEST SURGERY
FLORENCE S. LINDUFF. (10c)

THE RESPIRATOR IN THE TREATMENT OF ACUTE POLIOMYELITIS.
DOROTHY GRAVES. (10c)

PHYSICAL THERAPY IN THE TREATMENT OF NEUROSURGICAL CONDITIONS: *With Special Reference to New Electrodiagnostic Measures.*
EDNA L. DILLON. (10c)

PHYSICAL THERAPY MANAGEMENT OF LOWER EXTREMITY AMPUTEES.
PAIGE WEAVER. (10c)

WALKING TRAINING OF THE AMPUTEE: *Some Biochemical Considerations.*
SIGNE BRUNNSTROM. (10c)

BED EXERCISES IN EARLY CONVALESCENCE AND AMBULATION.
NILA K. COVALT, M.D. (10c)

THE PHYSICAL THERAPY REVIEW—*Special Anterior Poliomyelitis Issue.* July-August 1947 (75c)
The magazine contains 11 articles by leading physicians and physical therapists on research and treatment of polio. There are 16 abstracts of articles on polio from current medical journals.

A HISTORY OF THE AMERICAN PHYSICAL THERAPY ASSOCIATION.
IDA M. HAZENHYER. (50c)
An account of the Association's activities and growth from 1921-1946.

THE PHYSICAL THERAPY REVIEW—*Special Cerebral Palsy Issue.* May-June 1948 (75c)
This magazine contains 8 articles by leading physicians and physical therapists on research and treatment of cerebral palsy. There are 5 abstracts of articles on cerebral palsy from current medical journals.

Coming Meetings

Date	*Organization*	*Place*
Jan. 22-27, 1949	American Academy of Orthopedic Surgeons	Palmer House, Chicago, Ill.
June 19-23	American Physical Therapy Association	Copley Plaza Hotel, Boston, Mass.
Aug. 23-27	American Occupational Therapy Association	Book-Cadillac Hotel, Detroit, Mich.

Abstracts

John S. Coulter, M.D.

Series of Cases of Painful Back

J. A. Noble. In CANADIAN MEDICAL ASSOCIATION JOURNAL, Montreal, 58:437, May 1948. Abstracted in JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 138:4:318, Sept. 25, 1948.

The 104 cases reviewed by Noble concerned men who applied to a Department of Veterans' Affairs for relief of painful back. The average age was 33. There were only 6 over 50 years. The intervertebral disk was involved in 42 cases. Postural strain, arthritis, spondylolisthesis, traumatic strain, spondylitis, tuberculosis, fibrositis and bone injury were some of the other etiologic classifications. Many cases of backache were improved by the lumbosacral brace. In particular, in patients who have had a laminectomy without subsequent fusion and who have residual symptoms referable to the back, the brace may afford considerable relief. Operations were performed on 26 of the 42 patients with disk lesions. In 5 of the 26 cases operated on, no disk protrusion was found. Sixteen of the 26 patients operated on were sufficiently restored to go back to work, but 14 of them could do only light work and only 2 could resume full duty. Of the 16 patients with disk lesions treated conservatively, 11 could do light work and 4 could return to full duty; one could not be traced. Thus when a protruded intervertebral disk can be diagnosed, operation may not necessarily restore the patient. A study of the nature of the trauma resulting in chronic pain in the back suggests that the best treatment may well be some form of prevention. The human species has a constitutional weakness at the lumbosacral junction. In order to compensate for this deficiency, postural training is required.

Some Industrial Aspects of Rheumatism

Thomas Ferguson, M.D., D.Sc., F.R.C.P., Ed. F.R.F.P.S.G., F.R.S.E., Professor of Public Health, University of Glasgow. In THE PRACTITIONER, 963:161:170, September 1948.

The Need for Expansion of Treatment Facilities

If the amount of invalidism from rheumatism is to be reduced, there must be an expansion of treatment facilities in industrial centers with, in particular, the provision of treatment facilities available at times which permit of their use by workpeople without encroachment on working shifts. The centers in which treatment can be obtained for chronic rheumatic conditions in the evenings are not nearly so numerous as they ought to be. Pressure on limited existing facilities for physical therapy is so great that it often is difficult for the industrial worker to secure treatment directed to the relief of pain, especially in cases in which spectacular cure is no longer possible. Some physical therapists, hard pressed for time, are reluctant to deal with these cases; yet facilities for the relief of pain may make all the difference between capacity for work and enforced idleness.

Acute Rheumatism

As already indicated, acute rheumatism, unlike the more chronic forms of the disease, is not a major contributor to incapacity for work among the insured population, nor does it fluctuate with occupational groups to the same extent as the other. But acute rheumatism is, nonetheless, of considerable industrial importance, and not nearly enough attention is given to skilled vocational guidance designed to see that the young person with a history of acute rheumatism seeking to enter industry is, from the first, trained for work consistent with his capacity. It too often happens that young people with gross rheumatic heart disease are allowed to drift into work involving heavy physical demands which can lead only to early breakdown. In this connection it is worth recalling that some employments eminently suited to the physical and mental capacities of these youngsters are more or less closed to them by the operation of superannuation schemes, sufficiently drastic in their pre-employment requirements to exclude potential workers with rheumatic heart disease from employment of a kind most likely to afford them success and happiness in life.

Prevention and Treatment of Bedsores: An Air Mattress Accomplishing Alternation of Pressure Points

W. James Gardner, M.D., Cleveland. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 138:8:583, Oct. 23, 1948.

The most important single factor in the prevention or treatment of bedsores is frequent movement of the patient, so that pressure at any one point is not permitted to exist too long.

The principle of the alternating pressure mattress appears to be beneficial in the prevention and treatment of bedsores in some bedridden patients. It adds to the comfort of the patient and decreases the frequency at which the position must be changed.

Contributions to Clinical Electromyography: II.—Phenomena of Reciprocal Contraction of Symmetrical Muscles and its Significance in Muscle-Reeducation

Paul Liebesny, M.D., and Morris G. Blutstein, M.D., New York, N. Y. In AMERICAN PRACTITIONER, 111:2:103, October 1948.

1. The phenomenon of reciprocal contraction of symmetrical muscles has been discussed. If symmetrical muscles contract synchronously but with unequal force, the muscles contract with reciprocal strength.

2. This phenomenon has to be considered in muscle re-education. Active exercises against resistance of spastic, paretic muscles has to be avoided, whereas resistance has to be applied to flaccid, paretic muscles during active exercises.

3. The effect of impairment of the blood circulation in muscles and the changes of the EMG tracings caused by it have been demonstrated, and the probable usefulness of electromyography in the examination of peripheral vascular diseases has been indicated.

The Study of Peripheral Vascular Disease With Radioactive Isotopes: Part I.

Daniel C. Elkin, M.D., F.A.C.S., F. W. Cooper, Jr., M.D., F.A.C.S., R. H. Rohrer, M.S., W. B. Miller, Jr., B.S., Patrick C. Shea, Jr., M.D., and E. W. Dennis, B.S., Atlanta, Ga. In SURGERY, GYNECOLOGY AND OBSTETRICS, 87:1:1, July 1948.

1. Two methods for the use of radioactive sodium 24 in the investigation of circulatory physiology of the extremities are compared and discussed.

2. The apparatus is described in detail.

3. The results of one of the methods used in a series of normal individuals are evaluated. (The results of the other method are to be published later.)

Investigations into Effect of Hot, Dry Microclimate on Peripheral Circulation, Etc., in Arthritis Patients

G. Edstrom, G. Lundin and T. Wramner. In ANNALS OF RHEUMATIC DISEASES, London, 7:63, June 1948. Abstracted in JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 138:13:1000, November 27, 1948.

For the last six years Edstrom and his associates have had one ward in the rheumatologic department of the University Hospital in Lund constantly air conditioned at 32 C. and 35 per cent relative humidity. In this ward they have treated arthritic patients, each of them for about a hundred days. The peripheral circulation increased in all. Peripheral vasospasm was converted into peripheral vasodilatation. The arteriovenous anastomoses especially have been maximally dilated. The temperature of the skin, which was lower at an ordinary room temperature of 20 C. (especially in cases of rheumatoid arthritis) has been raised, particularly on hands, feet and distal part of the extremities. The relative oxygen saturation of venous blood, measured at the medial cubital vein, increased in the hot rooms, while the arteriovenous difference diminished. Cultures from the throat flora showed in most cases beta-hemolytic streptococci on admission of patients to the hot room, but only in 2 cases were such cocci detected at the end of their stay. These cocci apparently do not tolerate this dry hot climate. The most obvious effects on the clinical symptoms have been: remission of periarticular edema and capsular swelling of joints, diminished shifting pains and contractures, better appetite, improved function in cases of cardiac defects and disappearance of the blue livid coloration of skin on hands and feet. Tendency to recurrence immediately after removal back into ordinary room temperature has not been observed.

Progressive Spinal Muscular Atrophy

I. Irving Weintraub, M.D., Gainesville. In THE JOURNAL OF THE FLORIDA MEDICAL ASSOCIATION, XXXV:5:291, November 1948.

A Rip Van Winkle who has gone to sleep more than a century ago would wake today to find no essential change in the knowledge of the medical profession concerning many of the muscular atrophies. True, during this span of years, these atrophies have been classified and grouped and have undergone experimentation, but in 1948 the cause and the treatment still are unknown.

Treatment, according to Wechsler, is essentially symptomatic. He listed rest for the atrophic part and avoidance of exertion as helpful, electrical treatment as doubtful and possibly harmful, massage as useless, vitamin therapy as unencouraging, and orthopedic appliances as possible.

A review of the subject of progressive spinal muscular atrophy with a discussion of differential diagnosis is presented. Stress is placed on the continued enigma shrouding the various atrophies, most of which are without known etiology and treatment.

Longevity in Rheumatic Fever: Based on the Experience of 1,042 Children Observed Over a Period of Thirty Years

May G. Wilson, M.D., and Rose Lubschez, A.M., New York. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 138:11:794, November 13, 1948.

The longevity in rheumatic fever for the first four decades of life is presented.

An affected child has 4 out of 5 chances to survive childhood (to the age of 10 years), 3 chances out of 4 to survive puberty and 19 chances out of 20 to survive early adult life.

The over-all chance to survive to the age of 40 years is 1 out of 2.

Some Efficacious Methods in Physical Medicine: I—Shoulder Raising and Neck Exercises in the Treatment of Brachial Neuralgia

K. N. Lloyd, M.B., B.S., M.R.C.P., First Assistant, Dept. of Physical Medicine, London Hospital. In BRITISH JOURNAL OF PHYSICAL MEDICINE, p. 85, May-June 1948.

There are four common causes of brachial neuralgia, which are as follows:

(1) What can best be termed "the thoracic-outlet syndrome."

(2) Osteoarthritis of the cervical spine.

(3) Herniation of a cervical intervertebral disc, either frankly traumatic or in association with osteoarthritis.

(4) Fibrositis of the shoulder-girdle muscles.

Studies in Low Backache with Persistent Muscle Spasm

Judith P. Price, M.A., Research Associate, Laboratory of Neurophysiology, Washington University, Margaret H. Clare, B.S., R.P.T., and Frank H. Ewerhardt, M.D., St. Louis. In ARCHIVES OF PHYSICIAL MEDICINE, 29:11:703, November 1948.

Patients with acute and with chronic back pain (resulting from simple muscular strain, joint irritation, arthritis or psychogenic disturbances) have been studied through three methods: (1) localization of painful regions by repeated mappings of palpable painful foci; (2) removal of pain, either by treatment of the acute pain or by correction of abnormal patterns of activity in the chronic stage; (3) analysis of movements as a guide to the previous methods, using electromyographic recording of simple routine test positions and movements.

It has been found that the areas of pain or tenderness migrate from one muscle group to another or from one part of a muscle group to another region of the same group. This shift of pain seems to be associated with the abnormal patterns of muscular activity developed in an attempt to avoid or relieve pain.

Electromyographic studies during test movements have given objective evidence of such patterns of activity and of the relative amounts of activity in various muscle groups in relation to pain as compared to normal subjects. Relief of the abnormal tensions in the muscles by correction of the abnormal patterns of activity may assist greatly in alleviating discomfort and preventing recurrences of pain.

Conservative Treatment of Scoliosis in Selected Cases

Col. E. M. Smith, M.C., U.S.A., Chief, Physical Medicine Service, Walter Reed General Hospital, and Lieut. Col. C. D. Shields, M.C., U.S.A., Resident, Physical Medicine Service, Walter Reed General Hospital, Washington, D. C. In ARCHIVES OF PHYSICAL MEDICINE, 29:11:709, November 1948.

1. Scoliosis is a lateral rotary curvature of the spine. Idiopathic scoliosis is that type of which no cause is discovered to explain the condition.

2. Scoliosis, without structural changes, may be treated in a conservative manner.

3. Muscle testing, the application of a brace, the development of muscles by a planned, continuous program and gradual withdrawal of the brace are recommended.

4. The program must be within the fatigue tolerance of the patient and the capacity of muscle reserve.

5. Conservative therapy may well be utilized to prepare patients with scoliosis for spinal fusion when indicated. It is available for postoperative cases of spinal fusion.

6. Conservative therapy of lateral curvature of the spine must be judged by time, diligent application of the method and honest evaluation of the results.

Passive Muscular Exercise

Max A. Levine, M.D., Los Angeles. In ARCHIVES OF PHYSICAL MEDICINE, 29:10:642, October 1948.

The author presents a concept of regulated passive muscle stretching which has afforded very satisfactory results. In the past ten years this method of postimmobilization management has been of inestimable value. The purpose of this paper, however, is to present a technic with special reference to an apparatus which has proved to be invaluable. This equipment could easily and inexpensively be installed in any orthopedic office or department of physical therapy in a hospital. It consists of a modified ratchet-controlled windlass capable of exerting a considerable pull. The exact force of this pull is checked by a scale which is interposed between the patient and the table (stretching apparatus).

In an injured extremity after prolonged immobilization a considerable number of adhesions will develop. The longer these are allowed to remain, the denser they become. The pathologic changes which occur in soft tissues as a result of trauma and immobilization may be summarized as follows: There usually is a hemorrhagic exudate of varying degree into the muscles and areolar tissue at the site of trauma. Inflammatory exudate and edema fluid extend for considerable distances into the adjacent soft parts and often involve the whole extremity. This is the early swelling seen, for example, after fractures, which is aggravated by dependency. Even relatively minor subacute inflammatory changes which occur after strains and sprains may cause joint stiffness by interfering with the flexibility or the areolar tissues. Normal areolar tissue is a "somewhat soft structure of great tenacity, elasticity and suppleness and, when normal, containing a small quantity of a translucent lymphlike fluid, sufficient to keep it moist and supple." It acts as an agent for attaching various structures to one another and fills all crevices and spaces between muscles and other deep structures. Moistness and suppleness is of supreme importance to free and easy movement of parts. Creaking joints, under certain conditions, may be due merely to absence or diminution of this lymphlike lubricant of the areolar tissue. After trauma, even in minor injuries, this loss of flexibility of the areolar tissue may result in prolonged stiffness of joints and aching pains, especially when the involved limb is kept at rest for a long time. This type of stiffness is different from that produced by contractures of muscle and capsular ligaments, since it leaves soon after initial movements with removal of edema.

Summary

1. Passive stretching exercises are important in postimmobilization therapy.

2. The physiology of muscle stretch is discussed briefly. Passive muscle stretch stimulates vasodilation and increases the flow of blood toward the heart through stretching and compressing of the blood vessels.

3. A special ratchet windlass apparatus is used to facilitate the restoration of function of the various regions.

Physical Medicine in Orthopedic Surgery

Frank R. Ober, M.D., Boston. In ARCHIVES OF PHYSICAL MEDICINE, 29:10:628, October 1948.

In general, the orthopedic surgeon has long recognized the value of physical therapy measures in the rehabilitation of the physically handicapped.

It must be remembered that the physiology of deformity is an important factor in loss of function and that when a deformity has been corrected one still has a job to do in improving the function of the corrected part so that the patient will receive the utmost benefit. In the case of joints a good rule to observe is that, given a poor joint plus poor muscles which control that joint, the joint represents a real disability and will continue to do so unless something is done about it. It may be necessary to accept poor joint structure, but it is not necessary to accept poor muscle function, provided the innervation or a disease has not destroyed the controlling muscles. Physical therapy measures, used with judgment, will help to bring these muscles back to normal, and once this has been done a liability has been turned into an asset.

An imperfect joint that is used like a perfect joint usually will deteriorate if there is not musculature to protect it and help its function.

No joint must be allowed to sustain a load beyond its function, since to do so will increase the atrophy of its muscles which always occurs after injury or disease; it should be borne in mind also that a surgical procedure is an injury, and it too must be combated in any planned after-care.

Any physical measure which produces lasting pain must be abandoned or modified, since pain induces protective muscle spasm, interferes with the neuromuscular mechanism and contributes to an increase in muscle atrophy. Stretching procedures to relieve contractures may cause temporary pain, but if they are properly performed the pain should not last over an hour and will not be harmful. Pain which continues for twenty-four hours must be considered as deleterious.

Pain and swelling are combated with ice packs, cold compresses or heat. Some persons do not tolerate heat; in fact, it may make the condition worse. Heat and cold must be used judiciously. Extremes of either are too often bad treatment.

No joint is cured by being cooked all day and all night. Heat is used for a specific purpose—that is, to improve the circulation and relieve spasm. The prolonged use of heat is very liable to cause stasis which defeats its purpose.

Massage is a valuable asset in the management of orthopedic disabilities. It improves the circulation but does not remove muscle atrophy. When properly used, it helps to relieve muscle spasm and pain. Massage should be gentle and should never hurt. That type of massage which digs deep into muscles to remove so-called knots is more apt to be harmful than beneficial and too often results in more pain and increased muscle spasm, thereby defeating its purpose.

Massage alone will not restore function and should be considered as an aid to other physical measures. It is contraindicated in very acute lesions attended with pain and muscle spasm. It is a good physical therapist who knows when not to use massage.

Passive motion or exercise has a very limited field. It should be gentle and guarded. It is useful in moving joints within the limits of discomfort and helps to restore the patient's joint sense. It helps in the relief of muscle spasm, and again should be done gently, and it is indicated in joint or periarticular conditions in which there are adhesions plus a little motion. It does not remove muscle atrophy.

Electric stimulation is sometimes useful in stimulating seemingly paralyzed muscles after cerebral accidents. It does not restore power in total paralysis. It has been shown that it will prevent rapid muscle degeneration after a nerve has been severed.

Active exercises to restore muscle tone probably are the most valuable of all physical therapy aids, and, given a single choice of all the procedures, it is best to choose active exercises as being the most helpful and most productive in restoring function to an injured joint.

1. Simple muscle contractions are adapted to all convalescent patients, to the aged and to any single muscle or to a group of muscles.

There is a good deal of discussion in the current literature on getting surgical patients out of bed early, but nothing is said about how to get convalescent medical patients out of bed early. When a person has been in bed for a short

time, all his muscles lose tone and strength. As time goes on, increasing muscle atrophy is added.

The greater the loss of muscle tone and strength and the atrophy, the longer it takes the patient even to get about. The orthodox manner of treating the convalescent is to let him begin sitting up at intervals. Later he is told to dangle his legs over the side of the bed. Still later he is allowed to sit up in a chair for short periods, which then are increased; then someone comes along and with the help of others he is made to stand up and finally he is told to walk, which he does, usually assisted when he finds himself staggering down the room. All this is bad and takes much time.

The time element may be materially shortened, the convalescence made more rapid and hospital beds freed earlier, relieving what is now a serious situation in overcrowded hospitals. Muscle contractions can be taught to anyone who has even a small degree of intelligence. The simplest thing to do is to tell the patient to make his quadriceps muscles tight on both legs. Some intelligent patients seem to be stupid at first, but with a little patience success will come in a few minutes.

These contractions or muscle settings are done slowly, gently and firmly, beginning with a few at a time in order not to fatigue the muscle performing them, every half hour and gradually increasing until three hundred are done daily. Once this has been learned, the patient is taught to do the same thing to his calf and buttock muscles. It is important to begin with the leg muscles, because a rapid restoration to normal function in them means that he will walk sooner.

After the patient has learned to do all this, it is easier for him to learn to do similar exercises for his back and abdominal muscles. The back and posterior neck muscles are contracted by arching the neck and back at regular intervals. The abdominal and anterior neck muscles are strengthened by raising the head and shoulders 4 or 5 inches from the bed. Deep breathing exercises help the abdominal, chest and diaphragm muscles.

The arms can be exercised in the same way, beginning with the hands. The patient makes a slow fist, then flexes, extends, rotates, adducts and abducts the wrist. The fingers are released with some tension, separated, approximated and dorsiflexed. The next step is flexion and extension of the elbow and supination and pronation of the forearm. From this one proceeds to the shoulder, which is abducted, flexed, extended, hyperextended, rotated, elevated and adducted in the manner described for the hand. Once the patient has learned the whole program, he can combine leg, back, neck, chest, abdominal and all arm exercises in one effort for all instead of in separate groups.

This form of exercise is well adapted to the old, whose chief disabilities are going up stairs, arising from a chair and walking, the principal reason being that the quadriceps and gluteal muscles do not function well. This form of muscle setting is especially adapted to strengthening the muscles, and it also helps the peripheral circulation.

2. Active and passive or assisted active motion should follow the period of muscle settings when the muscles have a normal contour and tone. These are well adapted to patients with proliferative arthritis and may be carried out by the use of balanced traction in the early stages, to be followed by manual movements of an assistant plus active contractions by the patient. The passive movement should not cause any pain—i.e., the arc of motion must be within the range of discomfort.

3. Active exercises should be performed at first with gravity eliminated and later, as the muscle function is restored to normal, against gravity and finally against resistance. It is senseless to try to perform exercises against resistance if it is impossible, e.g., to extend the knee against gravity.

4. Weight-bearing exercises should never be allowed until all fluid has disappeared from the knee joint, there is no thickening of the synovial membrane and no pain and the quadriceps has normal tone, normal contour and normal strength. The vastus internus is the slowest portion of the quadriceps to recover.

Painful shoulders resulting from old injuries, bursitis or tendinitis of the suprascapular muscle nearly always show atrophy of the deltoid muscle. Long after the shoulder has recovered from its original condition it may be painful because of the atrophy of the deltoid. This muscle may be restored to normal by the form of exercising just mentioned.

Many lame backs continue to be lame or there are recurrent attacks because no one has taught the patient to restore his corset muscles, the gluteus maximum and the abdominals. Forward bending exercises are prescribed too often. Forward bending with the legs straight is a favorite position for securing a lame back and should not be indulged in. Forward bending in the sitting position is not so bad, but no active exercise of the back should be done until the gluteus and abdominal muscles have tone, contour and strength, all of which may be secured by muscle setting followed by exercises against gravity.

No joint should be exercised if the exercise causes pain that lasts.

No weight-bearing should be allowed until the physiology of the joint is restored.

The Use of Physical Agents in General Practice

Walter J. Lee, M.D., Richmond, Virginia. In SOUTHERN MEDICAL JOURNAL, 41:7:655, July 1948.

The active cooperation of the arthritic patient is essential for obtaining satisfactory results in mobilizing joints and maintaining good muscle tone. It is my opinion that in the early acute stage complete rest of the joint is indicated. Proper positioning and splinting are necessary during this early phase, and static muscle-setting exercises only are used. Watkins says that as the inflammatory process subsides carefully graded active exercises may be initiated; at first consisting of active assisted motions, and later of voluntary exercise. Resistive exercises are rarely indicated because of the tendency toward subluxation. As the process becomes chronic or a remission occurs, active resistive exercises can be instituted. These exercises are to be carefully graded and purposeful, being directed primarily toward gait and posture training. For developing strength, coordination and skill in the upper extremities occupational therapy is utilized. Mental as well as physical function is stimulated by this method. Occupational therapy can consist of anything, from weaving a rug to driving a nail provided the exercise performed is interesting, purposeful and directed toward improvement of function. Occupational therapy also may take the form of prevocational training as a part of adequate rehabilitation.

Rheumatoid spondylitis provides a condition to illustrate the value of special exercises in the prevention and treatment of disability. Deep breathing and postural exercises are a valuable adjunct when combined with x-ray and other recognized procedures.

Since rheumatoid arthritis tends toward chronicity, physical measures that can be utilized in the home each day are to be recommended. Treusch and Krusen reported a survey of home physical therapy in 229 cases of arthritis, and found that 93 per cent of the patients followed the instructions for home therapy and 65 per cent continued them for three months or longer. They observed that patients with more than one course of instruction were more likely to carry on. Four-fifths of the patients definitely were benefited, and two-fifths were enthusiastic over the regime. How physical agents may be used in general practice has been illustrated in the treatment of arthritis.

Aspects of Rheumatic Disorder

Dr. Philip Hench. In BRITISH MEDICAL JOURNAL, 4581:754, October 23, 1948.

Fibrositis was the chief rheumatic disease from which psychogenic rheumatism must be differentiated. In general, fibrositis placed its victim at the mercy of change in external environments (such as heat or cold) while psychogenic rheumatism intensified or receded with change in internal environment (mood, excitement, worry, fatigue.)

Physical therapy had variable results, sometimes making the patient worse. There was resistance to examination—the "touch me not" reaction—whereas in fibrositis the examination found a cooperative patient.

Doctor Hench stated that in the U. S. Army during the war psychogenic rheumatism was far down in the list of neuroses. He added that the pain that these patients endured was real, and he always impressed upon them the following, "Now I have not said that your pain is imaginary, it is real, and it is just as severe as you say it is. Don't go home and say I said it was 'all in your head.' And don't go home and say that nothing can be done for it; many things can be done for it."

Effect of Repeated Denervation Upon Neuromuscular Function

J. A. Morgan, M.D., J. D. Thomson and H. M. Hines. From the Department of Physiology, State University of Iowa, College of Medicine, Iowa City, Iowa. In THE AMERICAN JOURNAL OF PHYSIOLOGY, 153:1:109, April 1, 1948.

This investigation was prompted by reports that functional recovery of partially denervated skeletal muscle could be enhanced by increasing the degree of reinnervation through branching of remaining viable axons, a process known as neurotripsy.

The left tibial nerves of 120 female albino rats were crushed once, twice or three times, at intervals of 42 days. Strength and wet weight of the muscles supplied by these nerves were measured at 21, 42 and 84 days after the terminal lesion and compared with values obtained from unoperated control muscles. Comparisons also were made between muscles whose nerves had been crushed twice or three times and those whose nerves had been crushed only once.

Measurements of weight changes (calculated on the basis of muscle cell phase changes), tension per gram of contractile tissue (elicited by both indirect and direct stimulation) and tension by nerve stimulation in per cent of tension by direct stimulation show that (a) during the predominantly degenerative phase (21 days after the last lesion) values from one, two and three crushes showed no significant variation; (b) during the predominantly regenerative phase (42 days) values were slightly higher after two and three crushes than after one, and (c) during the phase of nearly complete recovery (84 days) values after two crushes were very nearly the same as after a single crush.

These results indicate that skeletal muscle can undergo repeated cycles of denervation atrophy and recovery without being significantly impaired in its regenerative capacity. The accumulative effects of such procedures are of small magnitude and point in the direction of a more effective reinnervation and recovery during the regenerative phase.

Causalgia: III. A General Discussion

Harris B. Shumacker, Jr., M.D., Indianapolis, Indiana. From the Department of Surgery, Yale University School of Medicine, New Haven, Connecticut. In SURGERY, 24:3:485, September 1948.

Though every effort was made to segregate such cases in special centers where the best opportunity existed for their careful evaluation and treatment, it nevertheless is true that the enormous volume of work, the limited personnel, and the lack of availability of certain apparatus precluded particular studies which in retrospect would have been informative. It is unlikely that an opportunity will present itself again for study of such large groups of cases. It is entirely possible, however, that intensive study of fewer cases may settle some of the remaining problems.

It would seem important to study the vasomotor responses in each patient by every available method, including digital plethysmography and venous occlusion plethysmographic blood flow methods whenever possible. It will be profitable to pursue further the reaction of patients to alterations in the state of vascular tonus induced by various methods, and to study the effect of a variety of drugs affecting autonomic function, including such agents as tetraethylammonium chloride. It will be important to correlate better the time of onset of vasodilatation and of pain relief following sympathetic block, and to evaluate carefully any persistence of pain during spinal anesthesia. Particular study must be made of cases of incomplete relief of pain after sympathectomy. The so-called atypical causalgias require further clarification. Finally, it is hoped that more animal experimentation may throw new light upon the problem of the nerve pathways and the mechanism of pain. Better understanding of the fundamental problems connected with major causalgia may be of aid in understanding more clearly the other allied painful states.

The Student Nurse and Physical Therapy

Thelma A. Brown, R.N., Chief Physical Therapist, Provident Hospital, Chicago. In THE AMERICAN JOURNAL OF NURSING, 48:10:657, October 1948.

The nursing school faculty frequently is confronted with the problem of what and how much instruction to give in physical therapy and how the physical therapy department of the hospital can be used as a meaningful experience in nursing.

This is an account of how one nursing school faculty planned to give its student nurses observation and experience in a physical therapy department.

The first step toward initiating this program was to plan a faculty education program which would arouse the active interest of supervisors, head nurses, and the general staff in the potential value of this service to nursing. We began with two one-hour lectures and discussions of patients from the various wards who were receiving physical therapy. The recognition and prevention of deviations from the normal in the daily bedside care of the patient were stressed.

The faculty could readily see that what the physical therapist was doing during the patient's visit to the department was not enough. He needed supervision in maintaining good body alignment throughout the day. Ace bandages needed to be tightened or correctly reapplied following exercise, in order to attain the type of end result that would be most beneficial to the patient. The student nurse assigned to the care of the patient could, after careful instruction and adequate supervision, supplement her nursing care to include these simple procedures and, consequently, assist in his early recovery.

As a follow-up of the lectures, plans were made for each faculty member to spend at least one day in the physical therapy department. Three weeks were devoted to this part of the program and, although attendance was required in the beginning, several nurses came voluntarily as often as they could be spared from the wards and clinic services. The faculty, having observed in the department, were better able to evaluate the benefits which the students and patients could receive and were eager for the service to be instituted.

The objectives for the student program are:

A. To assist in providing each student nurse with specially planned instruction and guidance in the principles of body mechanics and posture which will enable her to give better nursing care to her patients.

1. To help the student understand that every patient is potentially an orthopedic patient.

2. To assist in teaching the student nurse to recognize deviations from the normal and to take measures when possible to prevent their occurrence.

3. To provide an opportunity for the student to practice in the physical therapy department what she has learned in orthopedic nursing in order to develop certain skills in orthopedic nursing which can be applied to the care of the patient in the hospital or home.

4. To assist in broadening the student's understanding of the problems of crippling diseases so that she will understand how a conscientious and cooperative effort on the part of everyone giving care can speed up recovery and help to eliminate mental and economic stress.

5. To teach the student how to record orthopedic conditions observed on the admission of patients to the hospital, i.e., simple and obvious conditions such as dropped feet, knee flexion contractures, et cetera; and progress of the patient during the period of treatment.

B. To orient the student to special physical therapy technics so that she will better understand the need for close correlation of nursing and physical therapy. Such technics as the giving of muscle reeducation exercises to a patient with poor back muscles help her to understand why the patient cannot walk, without support, to the bathroom although his other muscles are good or fair.

1. To aid the student in teaching the patient to carry out the simple procedures of a given treatment between visits to the physical therapy departments and to stimulate interest in continuing the care until the maximum functional use is attained.

2. To assist the student in correlating orthopedic nursing lectures and observations in the physical therapy department with the skills taught in nursing arts classes on the wards and in the ward teaching program.

The length of time planned for student participation in the physical therapy department is two weeks. The first week of experience is given early in the freshman year. The principles of body mechanics are stressed in order that the student can begin applying them to herself and to her patients early in her nursing experience. The second period is given following the orthopedic surgeon's lectures and orthopedic nursing classes during the second year to assist in giving this instruction more meaning in its application to the total nursing program.

As basic preparation for experience in the physical therapy department, preclinical students are given three two-hour lectures with appropriate demonstrations, as follows:

1. Physiology, stressing joint motion. This lecture is correlated with the classes in anatomy and is chiefly designed to assist the student in detecting deviations from the normal range of joint movements.

2. Modified Hoffa massage, stressing massage of back. This instruction is correlated with nursing arts in the general care of the patient. In addition to teaching the simple massage movements and the comfort and relaxation of the patient during this treatment, it teaches the prevention of postural strain of the nurse giving the care.

3. Body mechanics. Good body mechanics in various positions. This lecture is correlated with nursing arts in the general care of the patient.

During the freshman student's experience in the physical therapy department, emphasis is on the normal individual. She is taught and supervised in the application of good body mechanics in various activities. This includes correct walking.

Methods which safeguard both the patient and the nurse in assisting patients who need help in getting up from a chair or in getting on and off the treatment table are taught and practiced.

The teaching emphasizes body mechanics rather than the actual carrying out of physical therapy technics. In the student's junior year when she has her second period in the physical therapy department, highly technical procedures such as the application of diathermy, radiation, and reeducational exercises are demonstrated with full explanations.

The student's experience also includes the removal and reapplication of braces, measuring for crutches, lifting of helpless patients on and off the table, assisting in writing instructions for home programs of treatment, and recording orthopedic conditions and treatments.

In order to arrive at the actual amount of participation by each student in the department, an experience sheet was devised. This is a list of the procedures which nurses are responsible for observing, participating in, or giving. The procedures and the teaching listed emphasize body mechanics.

Written and oral reading assignments are given each student. Reading material is available in the small library in the physical therapy department.

Increasing interest on the part of both the faculty and students has been shown in this program since its introduction.

We realize that we have made only a beginning in the work that we are trying to accomplish. However, progress is being made toward our objectives; namely, to help students integrate the principles of body mechanics and posture in their nursing and correlate nursing care with physical therapy to the end that more complete nursing is possible for all patients.

Kinesiologic Electromyography: II: The Trapezius

Leonard J. Yamshon, M.D., Baruch Fellow in Physical Medicine, Columbia University, and William Bierman, M.D., Assistant Clinical Professor of Physical Medicine, Columbia University; Attending Physician in Physical Medicine, Mount Sinai Hospital, New York. In ARCHIVES OF PHYSICAL MEDICINE, 29:10:647, October 1948.

As with other muscles which act in a group to perform a smoothly integrated movement, it is not possible to ascribe a given motion to the trapezius alone. For example, movements ordinarily attributable to the trapezius can still be performed, though incompletely and weakly, when the muscle is paralyzed after section of the spinal accessory nerve. It is possible to determine whether this particular muscle contracts during the performance of a motion. Our ultimate object is to observe the relationship of this activity to that of other muscles in the group.

We have attempted to utilize electromyography as an objective approach to the evaluation of muscle action. This method has its limitations, but to our knowledge it is the most exact technic available. It has yielded new and definite information.

Investigation of the trapezius muscle by electromyography reveals the following facts: (1) All three parts of the trapezius play a part in adduction of the scapula. (2) The upper portion of the trapezius elevates the shoulder; the middle portion also does so, but to a lesser extent. (3) The middle and lower portions of the trapezius are important accessory muscles in scapular rotation. They begin to function before 90 degrees of abduction or forward flexion is reached. In the erect position, the upper portion of the trapezius also acts as a scapular rotator. (4) The trapezius does not appear to be a prime extensor of the neck or a rotator of the head. It may act as an accessory muscle in these motions.

Electromyography

P. Bauwens, M.R.C.S., L.R.C.P., Director of the Department of Physical Medicine, St. Thomas's Hospital, London. In THE BRITISH JOURNAL OF PHYSICAL MEDICINE, 11:5:130, September-October 1948.

It may well be possible in the future to standardize recording technic and terminology to such an extent as to make examinations by a technician practicable, but the time has not yet come.

Bauwens believes that this clinical application of electrophysiology has great potentialities, but that the value of the contribution which it ultimately may bring to neurology will depend in a large measure upon how well it is supported during its developmental stages by the tripod made of the neurologist, the neurosurgeon and the morbid pathologist.

Each of these can confirm or reject a tentative diagnosis either on clinical grounds or as the result of an exploration or a biopsy.

Hemiplegia

IN THE BRITISH JOURNAL OF PHYSICAL MEDICINE, 11:5:129, September-October 1948.

It is reasonable to assert that, if a patient with hemiplegia fails to receive adequate treatment, one must attribute the deficiency to lack of facilities rather than to lack of interest.

Benefit is to be expected from the use of heat therapy and muscle reeducation. By means of the latter procedure the patient learns how to relax the spastic muscles and how to reestablish coordination. Exercises for the upper limbs should be designed to relax the flexor muscles and to strengthen the extensors. At first, single joints should be exercised; later on, more complex movements are allowed. Success is all the more likely to be achieved with the aid of occupational therapy. When contractures or adhesions limit movement at the shoulder-joint, pulley exercises serve to increase the range of motion.

Lowman recommends the use of the Hubbard tank for reeducative exercises in water. The exercises are of 30 minutes' duration, and are given from 3 to 6 times a week.

At present prolonged recumbency for hemiplegia is regarded with disfavor. Early ambulation offers the surest hope of securing effective reeducation, but in selecting the right moment to initiate this radical change in posture the physician is faced with one of the most difficult problems in the whole range of medicine.

Resuscitation

Council on Physical Medicine and the American National Red Cross. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 138:1:23, Sept. 4, 1948.

In asphyxia it is vitally important that artificial respiration be started without a moment's delay, according to the Council on Physical Medicine and the American National Red Cross.

The American National Red Cross and other organizations have taught the prone pressure method. This method has several important advantages: (1) It requires no apparatus of any kind and therefore can be started immediately. (2) It is easy to administer properly and has been proved effective in countless cases of asphyxia. (3) The victim lies prone; thus there is little danger of occlusion of the respiratory passage by the tongue.

An inhalator is an apparatus that delivers to the victim gas, usually oxygen, under low, continuously positive pressure. The resuscitator delivers the gas under either alternating positive pressure or alternating positive and negative pressure. Many apparatus now available can be adjusted to act either as inhalators or resuscitators.

It is important that a resuscitator of reliable type be used, and that it be checked at times to assure its proper adjustment. If the positive or negative pressures increase or decrease appreciably, insufficient ventilation of or damage to the victim's lungs may occur. It is highly important that people who operate the resuscitator be adequately trained concerning when and how to use the apparatus.

The air passages must be free from obstruction. The tongue sometimes presses back into the pharynx, shutting off the airway. The first aider should insert two fingers far back into the mouth and press downward and forward on the tongue.

If an accepted resuscitator is at hand, it may be substituted for manual artificial respiration with assurance that sufficient ventilation will occur. Manual artificial respiration, however, is all-important while the rescuer awaits a resuscitator. Use of the manual method should continue while the resuscitator is being adjusted, so that the victim's lungs constantly receive air.

If a person has not been breathing for five to ten minutes, the chance of survival is slight, even if the most efficient inhalators or resuscitators are used. Nevertheless, an attempt at resuscitation should be made when the slightest chance for recovery exists. Artificial respiration should never be stopped when a pulse or heart beat can be felt.

Osteoarthritis and its Treatment

Ernest Fletcher, M.D., M.R.C.P., Physician, Arthritis Clinic, and Lecturer in Rheumatic Diseases, Royal Free Hospital, London; Physician Queen Mary's Hospital for the East End, London; Physician, Arthur Stanley Institute, Middlesex Hospital, London. In THE BRITISH JOURNAL OF PHYSICAL MEDICINE, 11:5:136, September-October 1948.

Adjustment of posture obviously is important, for joints put at a mechanical disadvantage always will tend to show degenerative changes after a suitable lapse of time. Physical therapy is most useful. For the pain described some form of heat seems to be best, and perhaps diathermy gets nearer to the site of the trouble than does any other form. In the case of osteoarthritis of the hips very intensive treatment is needed—at least one hour a day, 5 days a week—and this is the only form of physical therapy which affects the condition. Weakness and wasting of muscles usually are treated by nonweight bearing exercises particularly of the active type, and some people use faradism, although the author feels this is hardly justifiable on a physiological basis. Particularly tender spots in the joints, if fairly well localized, are probably best treated, in the field of physical therapy, by erythema doses of ultraviolet irradiation given with the Kromayer lamp. The acute inflammatory episodes undoubtedly are best treated by diathermy.

Gentle stretching of the capsule under an anesthetic sometimes relieves the pain for a considerable period. Surgery has a place in the treatment, especially in the hip-joint, for which a vitallium cup arthroplasty is a popular operation. Magnuson in 1941 described the operation of joint debridement.

Clinical Manifestations of Infection with Poliomyelitis Virus

Albert E. Casey, M.D., Birmingham, Ala., William J. Fishbein, M.D., Francis B. Gordon, M.D., Chicago, and Frank M. Schabel, Jr., M.D. Under the direction of Herman N. Bundesen, M.D., Sc.D., Chicago. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 138:12:865, Nov. 20, 1948.

Most of the clinical observations on poliomyelitis have been limited to that relatively rare form of the disease which results in residual paralysis. Even here no controlled observations have been published which enable one to say

whether a great variety of symptoms are really typical of this disease. For instance, current articles in the foreign and American literature list diarrhea, sore throat, running nose and cough as symptoms of poliomyelitis, but offer no proof. It may be said with safety that outside of paralysis or paresis in a child with an acute febrile illness resulting in head drop, stiff neck and stiff back, and usually accompanied with moderate increase in the spinal fluid protein or cells, no symptoms have been firmly established. Children without these signs from whom the virus has been recovered have often been erroneously called "healthy carriers."

In the special survey of poliomyelitis which has been conducted in Chicago during the past three years, controlled field experiments were planned to elucidate the symptoms of all forms, but especially of the subclinical variety. Subclinical poliomyelitis may be defined as poliomyelitis without stiff neck, stiff back, paralysis or obvious paresis. It is the common or usual manifestation in persons infected with this virus, and a comparison of the symptoms in the subclinical and clinical forms is herein presented.

The symptoms reported by 97 children with poliomyelitis are compared with those among 66 noncontact children living in the same block with the patients, and among 91 control children living in neighborhoods ten or fifty blocks distant. Poliomyelitis was proved in each child by the recovery of virus from the stool or throat and/or by the occurrence of elevated levels of spinal fluid protein twenty-one to forty-five days after intimate contact with an infectious patient.

Thirty-three of the 97 had clinical poliomyelitis characterized by paralysis, paresis, head drop, stiff neck or stiff back. The remaining 64 were intimate contacts of infectious patients in whom subclinical poliomyelitis characterized by an absence of the aforementioned signs developed within five to twenty-one days after exposure.

No differences in the symptoms between the noncontact children and the controls were detected. Mild fever of short duration, headache, vomiting, constipation, myalgia and drowsiness characterized both the clinical and the subclinical forms of poliomyelitis, the difference being one of degree and increased frequency among the former. Sore throat was definitely not a symptom of the subclinical variety, but was significantly related to stiff neck, stiff back and paralysis or paresis. The possibility is discussed that the presence of sore throat in clinical cases and its absence in subclinical cases might coincide with the quantity of virus present in the throat and in the nervous system, with the infectiousness and clinical severity and with certain epidemiologic features of the disease.

Running nose, diarrhea and cough were definitely not related to the symptoms of either clinical or subclinical poliomyelitis. Evidence of poliomyelitis among children 6 years of age and under is difficult to obtain without an adequate field study, even though 80 to 100 per cent of such children succumb on exposure. The younger patients are less likely to report minor symptoms described in almost every instance by older children.

Transverse Rotation of the Segments of the Lower Extremity in Locomotion

A. S. Levens, M.S., C.E., Berkeley; Verne T. Inman, M.D., San Francisco, and J. A. Blosser, M.D., Berkeley, California. In THE JOURNAL OF BONE AND JOINT SURGERY, 30-A:4:859, October 1948.

A complete analysis of human locomotion is difficult. The fact that persons walk and run with apparent ease, and without conscious effort, does not imply that the mechanisms employed are simple or readily understood. A comprehensive study of locomotion includes not only analysis of the movements of the various segments of the body, but also the correlation of these movements with force studies and muscle action. Consideration of a problem of such complexity suggests that delimitations are necessary, and the present study endeavors to present but one component in the displacement pattern of the lower extremity.

Many investigators have reported their findings with regard to the movements of the various segments of the body, as projected upon the parasagittal plane. Few have described the motions projected onto the frontal plane. It is doubtful that any previous observers have attempted to measure the transverse rotatory motions of the various segments of the lower extremity, as projected upon a horizontal plane. It is conceivable that little attention has been given to transverse rotatory motions, possibly because motion in the parasagittal plane has usually been regarded as a more significant action in human propulsion.

Present indications are that transverse rotations of the various segments of the lower extremity are an important factor in the ease and rhythm of walking of normal individuals. In order to improve function, reduce fatigue, and prevent more or less continual abrasion at critical points on the stump of the amputee, provision in the prosthesis for allowing transverse rotations of the same order of magnitude as those in normal legs may be a major contribution toward the improvement of artificial legs.

Transverse rotations of the pelvis, femur, and tibia occur in all normal individuals. Inward and outward rotations of the segments are related to weight-bearing. Inward rotation takes place during the phase from minimal weight-bearing to full weight-bearing, and outward rotation occurs during the phase from full weight-bearing to minimal load.

The rotations of the lower extremity appear to be absorbed in the articulations of the foot and their related ligamentous structures.

Restrictions placed upon the normal transverse rotations will, to varying degrees, modify the synchrony and rhythm of walking. The awkwardness and discomfort of a patient, required to wear a leg brace which does not provide for these rotations at the hip, knee and foot, are no doubt due, in part, to the restriction of these motions.

At the present time no prosthesis for the lower extremity has purposely incorporated mechanisms to provide for transverse rotatory motions, except on an experimental basis. Suppressing this rotation prevents the prosthesis from approaching the behavior of a normal extremity, and thus requires alterations in the normal pattern of movement of the joints proximal to the amputation. Relative motion will take place where the resistance to torque is the least. During weight-bearing in the stance phase, this motion will tend to occur between the stump and the socket, producing a most uncomfortable force on the stump. This is particularly true of the above-the-knee suction-socket limb. In the below-the-knee amputee, in addition to the major rotations that occur between the trunk and the fixed foot position, there is further restriction of rotatory motion at the knee, produced by the side hinge bars connecting the thigh lacer and the shank. In the case of below-the-knee amputees who have adequate stump length and shape, the use of suction sockets and an ankle mechanism may make it possible not only to provide for transverse rotation, but also to do away with side hinge bars and lacers, which tend to restrict the normal action of the knee.

The incorporation of a simple mechanism which provides for transverse rotation of sufficient magnitude, together with a unit for the return of the foot to the normal position, may well constitute a major contribution to both the comfort of the amputee and the improvement of function and synchrony in walking. An experimental mechanism has been used on this project. All amputees who have employed this mechanism have attested to the very marked improvement in comfort.

Treatment of Fractures in General Practice

L. C. Powell, M.D., Beaumont, Texas. In TEXAS STATE JOURNAL OF MEDICINE, XLIV:6:440, October 1948.

The limb generally is not capable of its full use when the bony fragments have just united in good position. Young patients may return to work in a few weeks. It is necessary to allow older persons, especially those with a fracture of femur or tibia, from two to six months longer before hard work can be undertaken. In spite of good position of the fragments and in spite of exercise of the limb during the period of immobilization, the muscles have become weak and the lower leg swollen. If physical therapy is carried out in the right manner and begins only when the bones have properly united, no damage can be done, and the injured man, particularly when he is insured, has a feeling that something is being done for him. Massage and passive movements employed too early interfere with the rest necessary for healing and cause pain.

Radiation Hygiene: Hazards to Physicians, Patients, Nurses and Others from Use of Radioactive Isotopes

W. Edward Chamberlain, M.D., R. R. Newell, M.D., Lauriston Taylor, Ph.D., and Harold Wyckoff, Ph.D. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 138: 11:818, November 13, 1948.

The atomic age confronts the medical profession with seemingly unlimited opportunities, but equally with the gravest responsibilities. To match the eagerness with which he plunges into investigation of the tremendous possibilities of advance in medical knowledge, the physician investigator must possess the keenest awareness of the hazards to himself, his patients and working associates involved in the study and manipulation of radioactive isotopes and other products of atomic fission. Fundamental is the fact that there is no antidote to radiation injury. Prevention and unrelenting watchfulness are the requirements for what may be called radiation hygiene. Even physicians who are not engaged in this research must have knowledge of the technics involved, for they may have patients who have been exposed to radiations.

Many physicians are avid to put radioisotopes to work for medicine, to proceed as fast as possible to apply them to clinical problems and therapeutic arts. Are we physicians going to be able—as a profession—to proceed at equal speed in learning the art of protecting our patients, ourselves, our associates and the communities we live in from the grave and insidious dangers of these very poisonous substances? This paper is intended to point out the dangers and to make some suggestions for avoiding them.

A tab'e is offered as a graphic summary of the hazards that have been discussed.

The Role of Physical Medicine in the Life History of the Amputee

Mandell Shimberg, M.D., Chief, Physical Medicine Rehabilitation, Veterans Administration, New York. In ARCHIVES OF PHYSICAL MEDICINE, 29:11:719, November 1948.

To anyone who has come into contact with many amputees throughout the years, it is entirely obvious that for the most part many of their problems have been delegated to the limb maker, and the limb maker is entirely unfitted to handle more than a small proportion of these problems. It might be said that the surgeon should concern himself more with the total rehabilitation of the amputee. However, in the light of much experience, one must look farther afield to find someone who is willing to take hold of this problem of amputee rehabilitation, both of the upper and of the lower extremity.

For a considerable time it has been my opinion that the burden of amputee rehabilitation from its very inception must rest squarely with the physiatrist. Apart from actual surgery and the mechanics of limb construction, the problem is essentially in the realm of physical medicine. Physical medicine must play an important role in bringing the amputee back to a satisfactory way of life.

Psychologic preparation is, in my opinion, one of the most important and one of the most often neglected phases of such rehabilitation. It involves treating the entire person rather than any one part.

Preventive measures are of the greatest importance. It is easier to prevent deformities than to correct them. Good bed posture should be insisted upon as well as the very early inception of extension-adduction exercises for above knee amputees and quadriceps exercises for below knee amputees. Here the very important problem of stump conditioning is begun. The situation is paradoxical. On one hand, one seeks shrinkage of the stump, which is atrophy of tissue, and on the other hand one attempts development of the muscle fiber structure for good function. Atrophy appears quickly and is coincident with bed rest and the period of disuse. If a stump is left in disuse for a protracted period the activating stump-lever muscles undergo fatty degeneration and the muscle fiber structure is reduced in contractility. Yet, the by-products of surgery and a large amount of superfluous tissue must be got rid of. This is accomplished by planned pressure. Under proper care the skin will increase in thickness, the circulation will be improved and the muscles will increase in tone and volume. The stump will lose its abnormal sensitivity. Bandaging accomplishes two purposes: (1) It supports the circulation, and (2) it brings the stump down to a shape suitable for the fitting of a prosthesis. The old goal of a tapered conical stump no longer applies if the new type suction socket is used; in such a case a well muscled cylindrical stump is a better base for the prosthesis. The utmost care and intelligence should be employed in stump bandaging, especially in above knee amputees. It should, whenever possible, be applied by a competent, trained therapist. Within ten days after operation unless there are complications the patient should be entirely turned over to the physiatrist and his helpers for further treatment. The surgeon has done his job, and it is now up to the physiatrist to carry through. It is in this stage that one must be especially careful regarding the indiscriminate use of wheelchairs which, in case of above knee amputees, may predispose to the development of postural abduction—external rotational contractures of hips, and in case of below knee amputees, to flexion contracture at the knee. It is good practice in this stage to mobilize the scar by friction massage. Whirlpool baths may be used to advantage in the treatment of terminal stump edema, which, in many cases, can be attributed to impropor bandaging.

After about ten to fourteen days following operation, the patient is ready to enter the preprosthetic phase of his rehabilitation. This phase is by no means routine and varies greatly in different cases. The first duty of the physiatrist is to make a complete physiatric evaluation of the patient. The object, at this time, is to establish the need for, as well as the quality and quantity of, therapeutic exercise. No routine set of exercises can be prescribed, for there is no consistent pattern of muscle weakness. We must, of necessity, develop an accurate knowledge of each patient's body mechanics. Postural alinement of the body as a whole must be tested, and the plumb line test is of great value. Knowledge of all contractures in the vicinity of joints must be appraised. Furthermore, the muscle groups concerned with actuating the stump lever as well as other muscle groups should be tested for weaknesses.

One must correct defects in body alinement, establish

muscle balance and assure normal range of joint motion. It is important that attention be directed only to those muscles which require strengthening, to those joints which require further mobilization and to those defects in body mechanics which require correction. During this period attention should be paid also to maintaining the general body muscle tone.

There are several components of good walking with a prosthesis: balance and muscle coordination, smooth walking rhythm and equal length of steps. The patient must learn weight distribution and how to adjust the travel pattern of the prosthetic foot, so as to duplicate that of the normal foot. He must develop proper kinesthetic sense, so that at all times he knows where the artificial limb is. Furthermore, he must learn to achieve a uniform stride. He must be warned at the onset to go slowly with the wearing of his prosthesis or edema of the stump and pressure sores will develop.

It will be necessary after a period of training to evaluate his gait. Briefly, there are four important parts in the analysis of this gait: (1) weight bearing on the prosthesis, (2) motion of step with the normal leg, (3) weight bearing on the normal leg and (4) motion of step with the prosthesis.

Effects of Percutaneous Stimulation on the Circulation in Normal and in Paralyzed Lower Extremities

Khalil G. Wakim, Jean C. Terrier, Earl C. Elkins and Frank H. Krusen. From the Sections of Physiology and Physical Medicine, Mayo Clinic, and Mayo Foundation, Rochester, Minnesota. In THE AMERICAN JOURNAL OF PHYSIOLOGY, 153:1:183, April 1, 1948.

By means of the venous occlusion plethysmograph with a compensating spirometer recorder the effects of electric stimulation on blood flow in the normal and paralyzed lower extremities of 22 human subjects were studied. Cutaneous temperatures over the ventral aspect of the calf region of the legs were recorded before and after stimulation.

All the observations on the spastic lower extremities gave as a result of stimulation a definite increase of blood flow, which averaged 111 per cent and ranged from 32 per cent to 340 per cent more than the control value. After stimulation the spastic subjects experienced a reduction of their spasticity, which varied in magnitude and duration.

Similarly, after stimulation the blood flow in the treated extremities of normal subjects showed an increase, which averaged 86 per cent more than the control and ranged from 10 per cent to 210 per cent. The smaller magnitude of increase of blood flow in the extremities of normal subjects is attributed to their inability to tolerate as strong a stimulus as the spastic ones.

Electric stimulation of flaccid muscles produced insignificant changes of blood flow.

The increase of blood flow in the stimulated extremities, the muscles of which contracted vigorously on electric stimulation, and the insignificant increase or no change of blood flow in extremities, the muscles of which gave weak contractions or none on stimulation, strongly indicate that the increase of blood flow is chiefly contributed through the activated muscles.

Bringing Rehabilitation to the Voluntary General Hospital

Maxwell S. Frank, M.D., and Michael B. Miller, M.D., Beth Israel Hospital, New York City. In HOSPITALS, 22: 11:37, November 1948.

The future plan of therapy provides for an organized daily schedule for patients assigned to physical medicine, to be followed throughout the day. Activities will be listed for each patient, depending upon his status of convalescence. Provisions for occupational therapy also will be made as soon as practicable. We realize that rehabilitation cannot be successful if the patient is exposed to it only for 30 to 60 minutes a day. Only a daily graduated plan on a full-time schedule can be completely effective. The department of rehabilitation will function, as it should, on a full-time basis.

In line with modern practices, an important function of the department will be an organized service for the scientifically directed early ambulation and convalescence of the postsurgical patient. This is in the best interests of both hospital and patient and will result in a more rapid recovery, a shorter hospital stay and a greater availability of beds.

A program must depend for its success, to a large extent, upon its acceptance by the medical profession. Acceptance, in turn, depends upon the educational activities in this direction sponsored by the hospital. These should include lectures and demonstrations to the house staff, participation in general medical conferences in the hospital, participation in conferences of the specialties where cases common to both specialties are involved, the conduct of conferences within the department itself, and ward and classroom lectures to the school of nursing. Publication of research on current problems also is an important function in the operation of the department. We also anticipate a program in the clinical training of students from the departments of physical education of local universities.

Finally, as the department develops and its importance to the community increases, a more effective integration will be sought between the social service department of the hospital and the various voluntary organizations interested in rehabilitation.

It is hoped that this report may foster interest in the development of medical rehabilitation programs in other voluntary general hospitals.

The Treatment of Cerebral Palsy

John H. Crosland, M.R.C.S., D. Phys. Med. In THE BRITISH JOURNAL OF PHYSICAL MEDICINE, p. 81, May-June 1948.

The conservative treatment of cerebral palsy carried out in Great Britain is chiefly based on the work of Dr. Winthrop Morgan Phelps of Baltimore.

Successful treatment depends upon four things:

(1) Early and correct diagnosis
(2) The level of intelligence
(3) The earliest possible start of treatment
(4) Correct management.

Exercises: Young children should be encouraged to roll and crawl on the floor, and a daily regimen of physical exercises for all parts of the body must be started.

The child's position during treatment is important. As much help as possible must be obtained from gravity.

Atrophy of Disuse: A Definition

Arthur S. Abramson, M.D. In ARCHIVES OF PHYSICAL MEDICINE, 29:9:562, September 1948.

1. In muscle, the optimal stimulus for the prevention of atrophy is the production of tension by contraction of the muscle itself. Contraction through a full range and against a full load is best. Denervation has its influence only in making the process of disuse more nearly complete.

2. In the lower motor neuron, the optimal stimulus in preventing atrophy is the ability of the neuron and its axon to conduct impulses to a functioning effector organ.

3. In atrophy of bone, full function, again, consisting of intermittent weight bearing, is the optimal stimulus for the prevention of atrophy. Denervation plays only a small role.

Disuse atrophy is the decrease in sizes of tissues, due to the inability of these tissues to develop full function.

Erb's Palsy

B. Wolman. In ARCHIVES OF DISEASE IN CHILDHOOD, London, 23:69, June 1948. Abstracted in JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 138:12:922, November 20, 1948.

The term Erb's palsy is applied to that type of birth palsy in which the paralysis, or paresis, is confined to muscles supplied by the fifth and sixth cervical nerves. The deltoid, supraspinatus, infraspinatus, teres minor, biceps, brachialis, brachioradialis and supinator muscles usually are involved in cases of severe disease, whereas in cases of mild disease only some of these muscles are involved. Wolman reviewed the cases seen at the outpatients' department of a busy provincial teaching hospital during the last twenty-one years. Actually 125 persons with Erb's palsy presented themselves during that time, but the author has been successful in tracing and interviewing only 37 of this group. Injury at birth to the supraclavicular portion of the brachial plexus is the accepted cause of the condition. Skilled obstetric technic in delivery, particularly in the use of forceps, is the main factor in avoiding this paralysis. Large babies are more likely to be injured. A large child in a primigravida needs special care with the delivery of the head and arms. Treatment must be carried out from birth. Infants treated within the first month do well and results are 100 per cent successful. If treatment is delayed, contractures causing impaired function of the shoulder and elbow will develop quickly. The treatment consisted of adequate splintage, associated with massage, together with exercises in older children.

Book Reviews

Correlative Neuroanatomy. *By Joseph J. McDonald, M.S., M.Sc.D., M.D., Joseph G. Chusid, A.B., M.D., and Jack Lange, M.S., M.D. Fourth edition. Loose-leaf. Paper. Price, $3. Pp. 156, with 60 illustrations. University Medical Publishers, Post Office Box 761, Palo Alto, California, 1948.*

This book on "Correlative Neuroanatomy" in its fourth edition, second printing, is in outline form. It is a valuable reference for physical therapists. Section I shows the peripheral nerves, section II the principles of neurodiagnosis; section III, diseases of the central nervous system. Pages 138 to 160 cover the muscular dystrophies and atrophies, the neurological signs and syndromes, and the neurological examination. A complete bibliography is given. The illustrations are good, well drawn and with excellent detailed legends.

Occupational Therapy Source Book. *Edited by Sidney Licht, M.D. With an introduction by C. Charles Burlingame, M.D., Psychiatrist-in-Chief, The Institute of Living. Cloth. Price, $1. Pp. 97. The Williams and Wilkins Company, Mt. Royal and Guilford Avenues, Baltimore 2, Md., 1948.*

The first chapter on the early history of occupational therapy is by Dr. Sidney Licht. The sources of this subject are given by Doctors Philippe Pinel, Reil, Hallaran, Rush, Tuke, Esqurol, Leuret, Voison, Kirkbridge and Reid. In the following pages most of the important early writings in the field of activity therapy have been reprinted. Each will stand on its own merits. In order for the reader to appreciate fully their impact on accepted procedure and difficulties encountered by these essayists, the events which preceded and followed these writings up to the time the word "occupational therapy" was coined have been briefly outlined.

Psychotherapy in Child Guidance. *By Gordon Hamilton. Cloth. Price, $4. Pp. 340. Columbia University Press, 2960 Broadway, New York 27, 1947.*

This book is a report of the study of the child guidance program at the Jewish Board of Guardians in New York. It is written by a Professor of Social Work at the New York School of Social Work, Columbia University. It describes the process of diagnosis and evaluation carried out by the caseworker, psychologist and psychiatrist. Therapy then is carried out by the caseworker along psychoanalytically oriented lines. The main body of the book consists of chapters devoted to the analysis and management of various types of behavior disorder in the child. The chapters dealing with therapy of problems at various age levels are very informative and lucid.

The author has made a valuable contribution to the literature of child guidance. He has put into readily usable form the principles in use at the Jewish Board of Guardians. It should serve as a source of information as well as a means of interchanging ideas with other groups where the approach is not so rigidly psychoanalytical.

Athletic Injuries: Their Prevention, Diagnosis and Treatment. *By Augustus Thorndike, M.D., Chief Surgeon to the Department of Hygiene and to the Harvard Athletic Association, Harvard University; Associate in Surgery, Harvard Medical School. Cloth. Third Edition. Price, $3.75. Pp. 243, with 114 illustrations. Lea & Febiger, Washington Square, Philadelphia 6, Pa., 1948.*

This practical book has been thoroughly revised throughout. Many sections have been completely rewritten and the entire text brought up-to-date. New emphasis has been placed on the application of many recent advances in the physiology of exercise and an entirely new section on "Physical Fitness Testing" has been added to the chapter on physical fitness. Several new illustrations are included. Anatomy and physiology of the human body as they are related to physical exercise are considered in the first part of this enlightening work.

The second and third parts deal with specific injuries incidental to athletics. Their diagnosis and treatment are covered fully. The nature and frequency of injuries to the various parts of the body are analyzed from the point of view of a surgeon with wide experience at a large university in handling traumatic injuries on the athletic field and through the period of convalescence. This is a book of personal experience with interesting statistical tables and an extensive bibliography.

In its present form it will appeal to practicing physicians and to those concerned with industrial medicine as well as to school and college physicians, coaches, trainers and those individuals interested in physical education.

Diagrams and Directions for Making Equipment for Handicapped Children, Particularly the Cerebral Palsied. *Paper, loose-leaf. Pp. 10. Price, $1. Association for the Aid of Crippled Children, 580 Fifth Avenue, New York, N. Y., 1948.*

These diagrams are well drawn, a list of materials necessary for making the equipment is included and the directions are complete.

It is of extreme importance for the cerebral palsied child that strength and durability be considered in the construction of all pieces of furniture. Methods of giving them additional stability must be planned. The base needs to be excessively wide to overcome the danger of tipping. This principle has been followed in the construction of the equipment described in this publication.

Physical therapists will find these diagrams and directions useful in arranging for special equipment for handicapped children.

Health Instruction Yearbook, 1948. *Compiled by Oliver E. Byrd, Ed.D., M.D., F.A.P.H.A., Professor of Health Education and Director, Department of Hygiene, School of Education, Stanford University. Foreward by Roy Lyman Wilbur, M.D., Chancellor, Stanford University. Cloth. Price, $3.50. Pp. 320. Stanford University Press, Stanford, Calif., 1948.*

Like its annual predecessors, the 1948 Yearbook is a compendium of current information culled from health articles published during the year. The briefed material, totaling 308 items, is organized into twenty chapters, each preceded by explanatory comments.

During 1947 death rates in the United States declined, eight diseases attaining all time low marks. There is an estimated need for 10,000 to 14,000 more psychiatrists. School health programs show a lack of well trained persons. These are only a few of the significant developments in the 1948 Yearbook.

The Yearbook's excellent organization of material and the very large field it covers recommend it as a teaching tool and as a reference for public health workers, nurses and others interested in the maintenance of public health.

Posture and Nursing. *By Jessie L. Stevenson, R.N., P.T. Second edition, revised. Paper. Price, 50c. Pp. 96, with 79 illustrations. Joint Orthopedic Nursing Advisory Service of the National Organization for Public Health Nursing and the National League of Nursing Education, 1790 Broadway, New York 19, N. Y., 1948.*

The author, Miss Stevenson, has taught both physical therapists and nurses and is well qualified to write such a handbook as this. This revision of the second edition has been greatly improved by the addition of many illustrations. These illustrations show how body mechanics and good posture are applied to nursing procedures as well as to the nursing care of patients. The more extensive use of illustrations clarifies the discussions of principles and suggests how teaching through demonstration can be more effective.

The author does not wish to imply that the technics described and depicted in the illustrations are the only methods whereby good body mechanics may be utilized. Procedures may vary but should always be in accord with fundamental principles. The National Foundation for Infantile Paralysis, Inc., has financed preparation and publication of this handbook. The nursing profession is greatly indebted to the National Foundation for its educational grants which have assisted nurses to improve the quality of their nursing.

Every physical therapist should read this book. It will serve as an excellent guide for physical therapists in hospital positions who are teaching student nurses and in staff education programs in public health nursing agencies.

Meet Our New Contributors

Apperly, Frank L., M.D., Professor of Pathology, Medical College of Virginia, Richmond, Va. Doctor Apperly holds the following degrees: A.B. 1912, Oxford; M.R.C.S. and L.R.C.P., London, England, 1915; M.A., M.B., and B.Ch., Oxford, 1916; M.D., Oxford, 1920; M.D., Melbourne, 1923; D.Sc., Melbourne, 1924. He was appointed to Fellow of R.C.P.—London, Queens College in 1923.

Duvall, Ellen Neall, Baruch Center of Physical Medicine, Richmond, Va. Miss Duvall is a graduate of the Central School of Physical Education and the Harvard Summer School course in physical therapy. She also holds a Ph.D. in Physical Education from New York University. For many years she was affiliated with the Physical Education Department of Goucher College, Baltimore, Maryland. She formerly was head of the program in remedial gymnastics at Hampton Institute. She also worked as a physical therapist at Warm Springs Foundation for three summers and at the University of Maryland, Baltimore, for one summer. Since 1946 she has been affiliated with the Baruch Center of Physical Medicine where she is a Research Associate and Acting Chief of the Sub-section on Educational Research.

Gillette, Esther, Physical Therapy Consultant, Crippled Children's Section, Colorado Department of Public Health, 512 Majestic Building, Denver 2, Colorado. Miss Gillette graduated from the Colorado Agricultural College, with a B.S. degree in 1915. She graduated from Northwestern University Medical School course in physical therapy in 1931, and since that time has held physical therapy positions at the following places: Office of Mrs. Jean Collings, Portland, Ore.; University of Oregon Medical School, Portland, Ore.; Association for Crippled and Disabled, Cleveland, O.; Betty Bacharach Home, Atlantic City, N. J., and Warm Springs Foundation, Ga. Member: American Physical Therapy Association.

Rogers, Gladys Gage, Ascutney, Vermont. Mrs. Rogers had no special training in physical therapy, but served as a voluntary worker for many years with children with cerebral palsy. She spent two years as a voluntary worker at the Shriners Hospital, Springfield, Mass., and was co-director with Leah Thomas at Robin Hood's Barn School Camp for children with cerebral palsy. This camp was in operation for eleven years. Mrs. Rogers had a son with cerebral palsy who lived to be seventeen years old. Although he was very handicapped physically, Mrs. Rogers never ceased searching for new ideas and showed genius and originality in combining ways to give this child a normal life and environment.

Skowland, Helen V., Baruch Center of Physical Medicine, Richmond, Va. Miss Skowland has her B.S. and M.S. degrees in Physical Education from the University of Wisconsin. Formerly she was Assistant in Physiology at the University of Wisconsin, and Instructor in Physical Education at the University of Indiana. At present she is Assistant in Applied Physiology, Physical Therapy School, Medical College of Virginia, and a member of the research staff of the Division of Clinical Research working especially on the Clinical Application of Ergography to Disability Evaluation. Member: American Association for Health, Physical Education and Recreation, National Education Association, and Virginia Academy of Science.

Thomas, Leah, Ascutney, Vermont. Miss Thomas graduated in June 1914 from the New Haven School of Physical Education (now called Arnold College), and had special graduate courses in physical therapy at New York University. She worked with Dr. Joel E. Goldthwait for ten years, and taught in the Physical Education Department of Smith College. She also worked at Shriners Hospital, Springfield, Mass., and was especially interested in spastic children.

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